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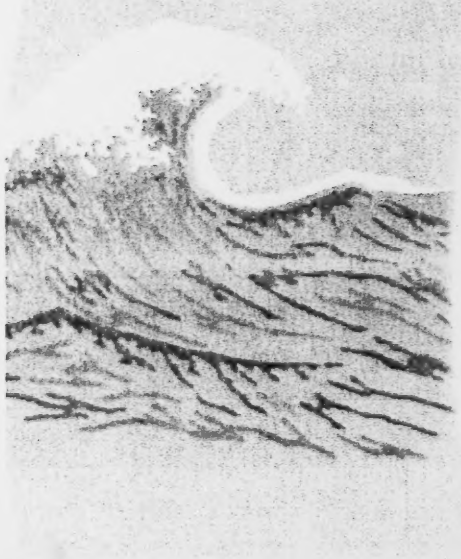
2002/2003 Conservation Requirements for Groundfish Stocks on the Scotian Shelf and in the Bay of Fundy (4VWX), in Sub-Areas 0, 2 + 3 and Redfish Stocks



Report to the Minister
of Fisheries and Oceans

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LETTER TO THE MINISTER

January 2002

Honourable Herb Dhaliwal
Minister of Fisheries and Oceans
200 Kent St.
Ottawa, Ontario
K1A 0E6

Dear Minister:

The Fisheries Resource Conservation Council (FRCC) herewith presents to you its report on *2002/2003 Conservation Requirements for Groundfish Stocks on the Scotian Shelf and in the Bay of Fundy (4VWX), in Sub-Areas 0, 2 + 3 and Redfish Stocks.*

Your Council's advice follows its consideration of the most recent scientific advice from the Department of Fisheries and Oceans, of its consultations with stakeholders in Atlantic Canada, and of the many written briefs submitted to the Council. The report contains advice for stocks on the Scotian Shelf and in the Bay of Fundy, of the south coast of Newfoundland, as well as stocks of the Grand Banks.

When the Council reported to you on 3Ps cod in March 2001, we delivered to you a prescription for the management of this stock. The medicine prescribed was a formula for a sustainable fishery in 3Ps. Many of our recommendations have been implemented, but in order to sustain this fishery, the total suite of measures recommended need to be enforced. There has been a relaxation of some of these measures.

As in previous years, there were overwhelming concerns that too much of the quota was being harvested in Placentia Bay, especially in the bottom of the Bay. Limits on the quantities of fish harvested there need to be put in place and enforced.

The conservation measures the FRCC has set out for this stock since the opening of the fishery in 1997 - dispersal of catch over space and time, the protection of spawning concentrations and the non-targeting of the 1989 and 1990 year classes - have to be effectively implemented. This year, at consultations there were reports of discarding and high-grading in the fishery. This must be monitored, and effective enforcement measures must be implemented. The above measures are prerequisite to a sustainable fishery.

Minister, the FRCC believes that there is a strong potential for growth in the 3Ps fishery. What we need is a long-term vision for this stock, and it is for this reason that the FRCC has begun to develop a Fisheries Resource Conservation Plan (FRCP) for 3Ps cod. Such a Plan incorporates strong conservation measures, and sets out the Council's objectives to achieve in rebuilding the stock. We believe that this stock could easily sustain fishing at levels approximating twice the current recorded catches, if we give it a chance to rebuild. In order to achieve this, we need the fishing community to fish responsibly: the recommendations in this report are a step in the right direction.

Harvesting capacity is still a major problem in Atlantic Canada. Even though actual numbers of fishermen may have decreased in certain areas, the technology to find and kill fish far outstrips the available resource. Closed areas and seasons are ways we are trying to address this problem, by limiting the ability of this capacity to fish.

This report also includes the Council's advice for stocks on the Scotian Shelf. For most of these stocks, the Council's advice maintains our past approach. This stability reflects the lack of recovery of many stocks, especially the cod stocks in 4Vn and 4VsW. It is of great concern to the Council that these stocks are showing no signs of recovery with little or no fishing. However, haddock in the same area appears to be increasing, with signs of positive recruitment. These conflicting signals are puzzling and raise the possibility that one stock might achieve fishable levels while the other remains depressed.

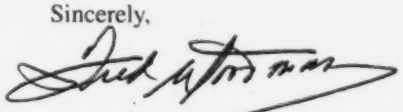
A significant concern to the Council in this report is the increasing catch of fish which have been recommended as by-catch fisheries only. White hake as an example, has been the subject of restrictive by-catch recommendations

in past reports, but catches have been increasing with the relaxation of allowed levels of by-catch. The Council has recommended that DFO review the various by-catch regimes which it applies.

In its first full report in November 1993, the Council asked for better information on catches of flatfishes in 4VWX. This recommendation has been repeated every year since, without implementation. As recently as last November, the Council was simply told by the Department: "*Reporting catches by individual species was not implemented in 2001. Implementation of this recommendation is a prerequisite to individual conservation measures.*" Such a response is clearly not satisfactory. It is clear that some of the individual species in these mixed flatfish stocks are in decline. Without more information on catches, and without the ability to differentiate amongst them, conservation measures targeting one species will be impossible and such measures will therefore have to apply to all flatfish. These stocks have sustained much higher levels of landings in the past, in some cases four to five times the current landings. We must not lose sight of this potential.

This report again outlines what the FRCC sees as the elements for the development of viable sustainable fisheries. In order for these measures to be effective, the cooperation and goodwill of the fishing industry is required. It is our hope that the industry will afford such cooperation and will endeavour to make these conservation measures operational.

Sincerely,



Fred Woodman
Chairman

Chapter 1: Introduction

Schedule for Full Stock Assessments

In the past, the Council has expressed concerns about what appears to be an ad hoc approach to the selection of stocks that would receive full assessments at the Regional Advisory Process (RAP) versus those that would be relegated to updates. In the Council's Science Priorities letter of December 20, 2000, the FRCC made detailed recommendations to address when and how stocks are to be assessed, and what annual information is necessary when stocks are not fully assessed.

For the sake of clarity, the Council repeats these recommendations, which have yet to be fully implemented and which still apply.

"DFO Science has decided not to undertake full assessments for every stock every year. The FRCC appreciate that such an extensive exercise may not be necessary, nor financially feasible. ***However, in order to be able to achieve its mandate and to make rational recommendations, the Council recommends the following elements:***

- ***A schedule for assessments be designed and followed. The FRCC wants to avoid an "open-ended" postponing of assessments. For our own long-term planning purposes, we also need to know when assessments can be expected.***
- ***The decision on which stock has to be fully assessed, and which has not, should be transparent (i.e. involving stakeholders) and should be based on precise and widely accepted criteria. A first criterion could be the fragility of the stock or to put it differently, "how long can we wait for a new assessment before we do irreversible damage to a stock". Other criteria might also be used, such as the importance of stocks for the local economy, or whether any significant change to a stock is foreseeably imminent.***
- ***When assessments are not conducted, basic information necessary to evaluate stock trends (research survey data, industry survey data, length or age distribution, etc.) should be provided."***

The Council is concerned that criteria for deciding which stocks are to be assessed have not been made public, and that stocks which are not the subject of full assessments do not have minimum standards for update information which is to be publicly provided. The Canadian Stock Assessment Secretariat has developed standards and guidelines which should be implemented to deal with these situations.

Management of By-catch Fisheries

Many groundfish stocks are managed on a by-catch basis. Some of these stocks are in moderate to healthy condition, others are in poor condition, and still others are in collapse. In the past, the FRCC established standardized terminology which it uses and is intended to differentiate and describe our recommendations in relation to the flexibility or restrictive nature by which by-catch measures should be implemented.

DFO Fisheries Management has developed a number of approaches by which by-catch fisheries are implemented. In some cases, catches of by-catch stocks are restricted to a maximum percentage of the total catch on a trip or daily/weekly basis. In these or other cases, a maximum total quantity may be specified on a trip or daily/weekly basis. In still other cases, DFO establishes an estimate of the total by-catch quantity that should be required for specific fisheries, and allocates specific quantities to individual or groups of license holders that are treated as "caps" with which these parties are expected to manage their respective quotas for all stocks in the given area. Finally, in some cases, these limits are caught as by-catch, independent of whether any of the directed species is caught. It would seem to make sense for DFO to review the various approaches in the respective regions, and adopt a best practice approach.

There are two concerns that the FRCC has with these approaches. White hake in 4VWX and 5 is a case in point. In December 2000, the FRCC recommended the following for this stock:

> ***"that there be a restrictive by-catch fishery only; measures should be implemented to minimize catches of this stock in all fisheries directed towards other species. In addition, consideration should be given by DFO in consultation with industry, to the establishment of incremental conservation measures."***

Despite this recommendation, DFO's by-catch cap approach resulted in extensive directed fishing by license holders. DFO's recent Stock Status Report (SSR) stated that longliners are landing between 50 and 90% of white hake as the main species and not as by-catch. Such a situation would clearly run contrary

to the spirit and intent of both the FRCC's recommendation and the precautionary approach.

The FRCC recommends that DFO Fisheries Management review and report on action taken to ensure that by-catch measures comply with the direction and intent of FRCC's by-catch recommendations.

In addition to this concern, in 2001 after the FRCC made its recommendation and before the commencement of the fishery, a decision was made to increase the white hake by-catch cap by 50% for some sectors, bringing the overall expected 'by-catch' to a level approaching 3,000t. Catches at this level are arguably more suited to a TAC approach to stock management. It is natural that fishermen would want to maximize their opportunity to catch fish that may be available to be caught. However, this 50% increase may not have been necessary to address a situation where by-catch levels were restricting other fisheries from being prosecuted. The effect of the magnitude and timing of this type of action is to undermine stock rebuilding efforts of the Council and, particularly in light of the Minister's decision to accept the FRCC's restrictive by-catch recommendation, to circumvent the process by which total removals of groundfish stocks are to be determined.

The FRCC recommends that by-catch limits be addressed through the normal process that has been established to recommend total removals for groundfish stocks.

Stock Structure and Dynamics

Virtually all interested parties agree with the need to have effective boundary definitions for fish stocks in order to better target conservation measures and to better protect individual spawning stock components. Indeed, as we grapple with measures to rebuild groundfish stocks, there are some people who remark that this may never be possible as some individual spawning stock components may have been inadvertently fished to commercial extinction, and can never be 'back-filled' by remaining components. Despite this agreement, despite this concern, and despite the wealth of knowledge held by individual scientists and fishermen, this knowledge has gone virtually untapped; there have been very few changes in stock boundaries and stock definitions in recent years. The Council again stresses the need for better understanding of basic biology, of stock structures and of stock dynamics. The identification of individual spawning and juvenile areas, and the movement patterns of these concentrations may not be scientifically verifiable at this time. However, **the Council recommends that DFO Science biologists be tasked to work with the fishing industry to articulate, 'map' and utilize working assumptions on these stock components and their dynamics.**

Species Interaction

Groundfish fishermen continue to observe and express opinions that fisheries directed towards non-groundfish species, for example the herring, shrimp, crab and offshore clam fisheries, have had the effect of changing the ecosystem and reducing food supply for groundfish. Perhaps the most apparent change in the ecosystem in some areas is with the ever-increasing seal herds that continue to have a negative impact on the ability of groundfish stocks to regenerate and survive. This whole subject matter is a very complicated one from a number of perspectives, not the least of which is the lack of good information on cause-effect relationships that may be at play. However, the lack of scientifically verifiable information should not result in paralysis from a conservation or management perspective.

The FRCC recommends that DFO Fisheries Management work with industry groups representing the different fisheries, to organize a series of targeted discussions designed to review relevant information on designated species interactions (e.g. cod and herring), and to identify and evaluate options (e.g. designated restricted fishing areas) to reduce the potential negative impact from one fishery to the other.

The Maritimes Regional Advisory Process (RAP)

The fall RAP in the Maritimes region was marked by a number of "firsts". For the first time at the 2001 RAP, the meetings were scheduled over several time periods and in different locations. The series of meetings were timed to deal with parcels of the stock status analysis exercise (e.g., data, analyses, outlook). Four stocks were assessed in 2001, namely, 4TVW haddock, 4Vn cod, 4VWX white hake, and Atlantic halibut in 3NOPs4VWX5Zc. With the exception of halibut, these stocks continue to be under moratoria to fishing (4Vn cod, 4TVW haddock) or are caught only under restrictive by-catch regulations (4VWX white hake). In total, including commercial halibut catches, these non-directed stocks have total average annual yields (from

1995-2001) of only 4,000t. Other groundfish stocks along the Scotian Shelf (with total average annual yields of approximately 50,000t) were not discussed at RAP - update reports were provided for some but not all of these unassessed stocks. Finally, this RAP also introduced a new assessment methodology, namely, the Traffic Light Method as the key instrument for qualifying stock status of the four assessed stocks in this region.

Unfortunately, the significant changes to Maritimes RAP in 2001 were poorly communicated to the fishing industry, the FRCC, and the public interest groups. The timing of the multiple meetings were announced late and then later changed. Partly for this reason, attendance by industry and other groups was poor and peer review and discussion were restricted compared to past years. The introduction of a completely new methodology applied to stocks with mainly poor data content made interpretation of results difficult. Moreover, the results of the new process and approach left many observers, especially among industry members, with the impression that the assessments were 'incomplete'. As noted in this report, Council members, in reviewing the Scotian Shelf stocks, at times found it difficult to work with the limited information provided and new results that were left unexplained and not interpreted in some stock status report documents.

The FRCC is concerned about the lack of peer review and industry involvement in the 2001 Maritimes RAP and that its ability to understand the important science contribution might be jeopardized if this trend should continue.

The FRCC recommends that in the future DFO Science, in compliance with the Canadian Stock Assessment Secretariat guidelines, clearly indicates to all stakeholders, including the FRCC, the science remits for stocks, the timing and agenda of all RAP meetings, and ensures adequate peer review for all its meetings.

Traffic Light Approach

DFO Science in the Maritimes Region is in the process of continuing the development of what is called a 'Traffic Light Method' to categorize (through red, yellow and green lights) multiple indicators of the state of fish stocks. It is intended that when combined with a set of decision rules, this system would be a premier tool for implementation of a precautionary management framework for fish stocks in the Region. The FRCC welcomes this initiative, particularly as a mechanism for systematic representation of the status of fish stocks that may be considered to be 'data-poor'. The Council notes with some apprehension the apparent intent of DFO Science in this Region to also use this approach for stocks for which there are 'good' data. This apprehension is in part based on indications that future stock status reports would be presented to the Council, the industry and the general public through or based on this colour representation, and exclude presentation of available quantifiable information upon which stock status reports have been based up to now.

The FRCC recommends that available quantitative information on stock status continue to be included in SSRs and Research Documents in addition to any future use of traffic light representations.

The Council also has concerns regarding the development and use of such a system within one Region of Atlantic Canada, without apparent regard to its design and applicability to other groundfish stocks across Atlantic Canada. In the view of the Council, cost-effective scientific endeavour, improved understanding of the marine resources and their eco-system, and the design of effective conservation regimes are all more likely to be achieved through better integration of resources and approaches. It would appear to be highly problematic for the status and conservation of Atlantic groundfish stocks to be evaluated and approached through a patchwork of different tools and models to the extent they exist simply as a result of there being separate organizational structures within DFO Science.

The FRCC reiterates its recommendation that DFO Science be less regional in its approach, and ensure there is effective coordination on this subject matter between regions.

Oil & Gas

Over recent years, there have been a variety of concerns raised by various industry participants regarding the interaction and impact of other activities on the future of groundfish stocks in Atlantic Canada.

With respect to the oil and gas industry, **the Council repeats previous recommendations that effective dialogue take place between representatives of the fishing and the oil and gas industries. We also repeat our recommendation that the potential impacts of oil and gas activities, especially on critical habitat be assessed by the Federal Government, towards development of a framework to limit the activities of the oil and gas industry as appropriate.**

Oceanographic Conditions

On the Scotian Shelf:

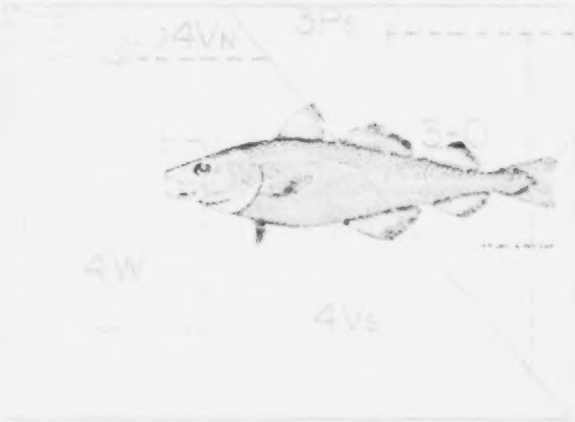
After over a decade of cold water trends on the northeastern Scotian Shelf and after the cold water intrusion experienced in southwestern areas of the Shelf in 1998, near bottom water temperatures rose to above normal levels in 1999 and 2000. The available data for 2001 indicates surface temperatures in the northeastern Scotian Shelf were about 1-2 degrees above normal, but were much below normal in the southwestern areas. Near-bottom temperatures throughout most of the Scotian Shelf in July cooled significantly from the above normal conditions of 1999 and 2000, to near normal or slightly below normal levels.

Off the South Coast of Newfoundland:

The warming trend seen during the 1998-2000 period did not continue: in 2001, water temperatures cooled to values seen in the mid-1990s. There was an increase in the coverage of cold water, which covered about 30% of St. Pierre Bank in 2001. Cold water events on the shallow parts of St. Pierre Bank have been associated with a shift of cod to deeper waters at the time of the year when the research vessel survey is conducted. The warmer period of 1998-2000 was associated with the reappearance of cod in shallower waters, while the cold event of 2001 seems to be associated with a shift of cod to deeper water.

Chapter 2: Stock-by-Stock Recommendations, Scotian Shelf and Bay of Fundy Groundfish Stocks

COD - 4VSW



PERSPECTIVE

The Cod Fishery in 4VsW has supported a commercial fishery since the 1800's. Since 1977 this has been predominantly a Canadian fishery. While both mobile and fixed gears have prosecuted this resource, since 1977 trawlers have accounted for 70-75% of landings and longliners most of the rest.

The cod resource on the Eastern Scotian Shelf is a complex of spawning components including at least two major offshore groups (Western/Sable and Banquereau) and a chain of smaller coastal spawning groups. The situation is complicated by the presence of both spring and fall spawning in several of the spawning components (Sable/Western offshore and various inshore areas).

Growth rates differ between 4Vs and 4W so that in the 1970's, fish in 4Vs reached 68cm at age 7 while in 4W reached 72cm. In the mid-1980's, growth declined in both areas and the average length at age 7 dropped to 39cm respectively from 1983 to 1993.

Catches from 1970-1989 have averaged 44,000t. Following FRCC advice, the fishery closed in September 1993 due to a drastic stock decline. Limited removals have continued since the moratorium for the purposes of sentinel surveys and by-catch for other fisheries.

Consultations on 4VsW Cod were held in Barrington (November 19), Port Hawkesbury (November 20), and Dartmouth (November 21). While 4VsWCod were not discussed at great lengths, there was an agreement with the stock status report on the condition of this stock. However, fishermen feel that grey seals are a large problem and that this stock cannot rebuild without addressing this issue.

ANALYSIS

The most recent full assessment of this stock was conducted in spring 1998. Annual updates have been conducted since. The 1998 DFO Stock Status Report and the 2001 Maritimes Region Groundfish Update indicate that:

- Average weight at age has shown some improvement in the last few years from the historic minimum in 1992.
- Surveys indicate that, since the mid-1980s there has been an increase in the mortality of cod, other than attributable to fishing, and which has persisted even after the closure of the industry.
- The scientific evidence indicated that the increase in mortality from sources other than reported landings includes discarding, direct and indirect effects of harsh environmental conditions, and predation by seals.
- The spawning stock biomass is at or near the lowest level seen, between 5% to 16% of the average from 1979-89. Making plausible assumptions about seal consumption and other natural mortality, the biomass is projected to decline 5% to 20%, even in the absence of any fishery.
- There are inconsistent indicators of recent year class strength, however, the weight of evidence suggests that recruitment has been poor.
- The models of cod consumption by grey seals imply a range from 5,400t to 22,000t of cod being removed by seals. These are relative to estimated biomass of 32,000t to 37,000t respectively. It is not possible with the available data to choose among these models.
- Catches have been taken as by-catch in other groundfish fisheries.

The FRCC continues to be particularly concerned about the very low productivity of this stock and the lack of growth of the spawning stock since the fishery closure in 1993. Two key issues are thought to be related to the poor productivity of the stock:

Figures are in 000t

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001*
TAC	55	48	44	38	35.2	35.2	35.2	35.2	Moratorium								
Catch	57.8	57.1	45.5	38.2	37.2	34.3	33.2	29.8	3.2	0.35	0.28	0.24	0.25	0.26	0.26	0.13	0.08

*Canadian Catch as of Dec 12/01

1. Figures are from the Integrated Fisheries Management Plan Atlantic Groundfish

1) Environment: In 1998, this area experienced lower than normal water temperatures and scientists reported an increase in cold-water species such as capelin in this area. In 1999 and 2000, this cold-water trend seems to have dissipated. It is anticipated that the warmer water now in the area will have a positive effect on recruitment.

2) Seals: The mean percentage of cod (mainly of younger ages) in the grey seal diet has remained at about 12%. Given that the grey seal population has apparently continued to increase at the same rate as previously measured, the estimate of consumption of 4VsW cod by grey seals in 1997 was between 5,400-22,000t.

The distribution of catches in the sentinel surveys show most of the cod are found on the 4W banks (Western, Sable, Emerald) throughout the year. The sentinel survey distribution also indicates that, at least during the fall, there are concentrations of cod in the near shore areas.

The short-term prospects for the fishery remain dismal. The productivity of the stock is very low, there are several factors causing increased mortality overall as well as seal predation on the younger age groups. The spawning stock biomass, while not declining, has not rebuilt since the closure of the fishery. The FRCC has not changed its outlook on this stock.

The FRCC recommends that there be no directed fishery for cod in 4VsW in 2002/2003.

The FRCC recommends that there be a restrictive by-catch fishery only; measures should be implemented to minimize by-catches of 4VsW cod in all fisheries directed at other species.

The FRCC recommends that no recreational or food fisheries take place given the very precarious state of the cod stock in this area.

The FRCC recommends that the sentinel survey continue for the 2002/2003 fishing year.

Sources

DFO Science

SSR A3-03 (1998) Eastern Scotian Shelf Cod

SSR A3-35 (2001) Update on selected Scotian Shelf Groundfish stocks in 2001

FRCC Consultations

Barrington, NS (November 19)
Port Hawkesbury, NS (November 20)
Dartmouth, NS (November 21)

Written Briefs

Eastern Nova Scotia 4VsW Management Board – Nellie Baker Stevens (2001-010-00233)

Council's Views on Stock Status

Overall Indicator:	low
	Compared to average
Spawning Biomass:	below average
Overall Biomass:	well below average
Recruitment:	below average level Of recruitment
Growth and Condition:	below average
Age Structure:	below average (smaller fish at age)
Distribution:	below average
Recent Exploitation Level:	fishery closed since September 1993

Cod - 4Vn (M-O)

Perspective

Cod landings in NAFO Subdivision 4Vn have declined since 1985 until the closure in 1993. Throughout most of the 80's catch quotas restrained the fishery, but after 1990 the catch was substantially less than the TAC. Following FRCC advice, in September 1993 the cod fishery was closed and this moratorium is still in effect. In the few years prior to closure, vessels using mobile gear generally managed to maintain a catch close to their allocation, whereas the longline fleet fared less well. Mixing of Gulf of St. Lawrence (4T) cod with the resident stock and the inability to accurately apportion landings according to stock has complicated the assessment and management of 4Vn cod. Prior to 1993 the fishery was defined for the months May - November, afterwards it was re-specified from May - October to more closely correspond to the migration of fish from the Gulf of St. Lawrence.

From 1960-1975 in 4Vn there were foreign cod catches from Russia, Spain, Portugal and France as well as domestic catches from Canada. Between 1975-1985 only France and Canada fished for this stock, and since all catches are Canadian.

Since 1960, catches averaged around 6000t/year with a high of 10,000t being caught in the mid 60's and the 80's, until the last decade where only 660t has been the average annual catch.

Consultations on 4Vn cod (M-O) were held in Port Hawkesbury, Nova Scotia on November 20, 2001. Generally fishermen expressed the view that the cod stock does not seem to be in as much difficulty as is portrayed in the Stock Status Report (SSR). Fishermen report good Commercial Index catch rates that were not taken in account in the stock assessment. This issue of the Commercial Index catch rates not being used by DFO Science is an extremely sore point with the fishermen.

Analysis

The 4Vn (M-O) cod fishery has been closed since September 1993. Nevertheless, the stock shows little sign of recovery, largely due to lack of recruitment. The stock is monitored by annual DFO groundfish trawl surveys in July and since 1991 by an inshore survey. In addition, a sentinel survey employing commercial longliners, inaugurated in September 1994, has been conducting July and September surveys on annual basis since. All these surveys gave a similar picture of the stock status. Until there is substantial recruitment, and it survives to reproductive age, there are no prospects for a re-opening of this fishery.

Again this year, the Council continues to be concerned with the poor recruitment from the 1988 to 1996 year-classes, although there have been recent signs of improved recruitment. The 2001 SSR notes that the estimates of total mortality from the July survey indicate that natural mortality could greatly exceed the 0.2 level traditionally assumed. This high mortality implies slow stock rebuilding. The assessment of this stock has high uncertainty and the Council recommends that the information gathered by the 4Vn Sentinel program be continued and provide additional information on this stock.

The FRCC recommends that the Sentinel Survey and Commercial Index Fishery continue and that the average of 275t of cod used in past years be made available to the 4Vn fishermen participating in these initiatives.

In other regions and bays, acoustic surveys for cod prove valuable to assist in determining the trawlable biomass.

The FRCC recommends that DFO Science, in consultation with the 4Vn fishery participants evaluate the feasibility of conducting a one time acoustic survey to assist in determining the current biomass.

At consultations, the Council heard from fishermen that there were still many grey seals around the Bird Island area and that they feared that the juvenile groundfish in the immediate area were being consumed at an alarming rate.

Figures are in 000t

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001*
TAC	12	12	9	7.5	7.5	7.5	10	10					Moratorium				
Catch	12.1	12	10.3	8.9	7.3	4.9	4.6	4.2	0.6	0.06	0.05	0.05	0.05	0.043	0.075	0.05	0.22

*Canadian Catch as of Dec 12/01

1. Figures are from the Integrated Fisheries Management Plan Atlantic Groundfish

Last year's recommendation of evaluating Bird Island as a seal exclusion zone for the protection of juvenile groundfish is still deemed necessary and progress should continue on this matter.

Sources

DFO Science

SSR A3-35 (2001) Cod in Sydney Bight

FRCC Consultations

Barrington, NS (November 19)
Port Hawkesbury, NS (November 20)
Dartmouth, NS (November 21)

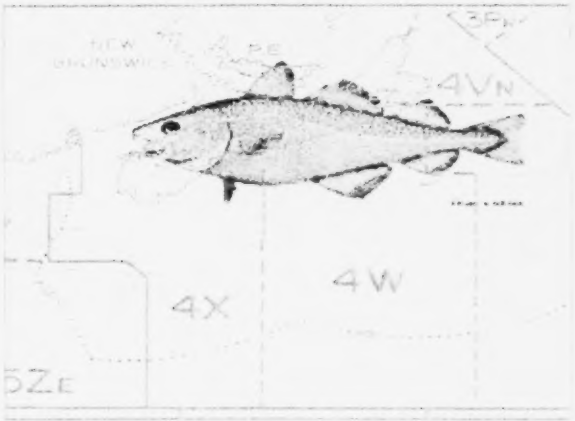
Written Briefs

4Vn Groundfish Management Board (2001-010-00233)

Council's Views on Stock Status

Overall Stock Indicator:	stock above minimum but not growing fast since moratorium. Apparent high natural mortality a cause for concern.
	Compared to average
Spawning Biomass:	below long term average
Total Biomass:	below long term average
Recruitment:	slight signs of improvement
Growth and Condition:	condition factor below long term mean
Age Structure:	average but low in absolute abundance
Distribution:	larger fish concentrated along the slope, smaller fish found inshore
Recent Exploitation Level:	below $F_{0.1}$ since 1994.

Cod - 4X5Y



Perspective

Juvenile cod in 4X5Y feed on a wide variety of invertebrates and as they grow, they include fish in their diet. Cod in 4X5Y reach 53cm on average by age 3 years and increase to 72cm by age 5 and 110cm by age 10. Age at first reproduction generally occurs at age 3 and individual females tend to spawn several batches of eggs during a single spawning period. The fecundity of females at first maturity is low then increases dramatically with age. Seasonal migrations associated with spawning cod occur over a number of spawning areas in 4X5Y, the largest occurring during winter on Browns Bank where peak spawning occurs during the winter.

Cod in 4X5Y have been fished commercially since the 1700s. Until the 1960s, the cod fishery was primarily an inshore fishery. Following extended jurisdiction to 200 miles in 1977, only Canada has made substantial landings of cod in this stock management area. Reported cod landings since 1985 have been below 30,000t. Average landings since 1995 are below 10,000t. TACs for 2000/2001, 2001/2002 and projected TAC for 2002/2003 reflect the policy announced by the Minister of Fisheries and Oceans on March 31, 2000 for 4X5Y cod exploitation at the level of 6,000t for three years.

There are two dominant gear types that exploit this stock: mobile draggers (less than 65 feet LOA) and fixed gear (longline/handline and gillnets - small boat, also less than 65 feet LOA fixed gear). Historically, this fishery has been dominated by mobile gear except during 1990-93 when the proportion of landings taken by fixed gear was greater. The groundfish fishery in 4X5Y is prosecuted throughout the year with fleets adjusting their timing for weather and fish abundance. The ITQ fleet (MG<65') adapts its fishing strategy to available quotas and is now more seasonal in fishing pattern depending on quota availability and markets. The small fixed gear fleets fish primarily in June and July with more large vessel (>65' LOA) and ITQ participation during the fall period.

Interim Stock Objectives

The Council has made recommendations for 4X5Y cod based on the following objectives for this stock. These objectives and conservation measures for 4X5Y cod are being discussed with 4X5Y fishermen toward the development of a long-term Fisheries Resource Conservation Plan for this stock. The objectives are:

A. Conservation and Rebuilding of Commercial Groundfish Stocks

a) **Ecosystem Health**. To prevent or to mitigate human disturbances of species diversity, genetic variability, ecosystem productivity, structure, and function, and marine environmental quality

b) **Rebuild.** To rebuild the spawning stock biomass (ages 4+) to the targeted range

c) **Conserve.** To identify, monitor, and avoid over-exploitation of individual spawning stock components and juvenile rearing areas within the management area

d) **Research.** To investigate, monitor and establish guidelines regarding the reproductive capacity of the stock, substock components, and interactions with the ecosystem

B. Sustainable Utilization and Relative Stability in the Fishery and Management Regime

a) **Sustainable use.** To maintain the ecosystem resources for the use of future generations

b) **Long-term view.** To adopt a longer-term view of stock management linked to spawning stock biomass levels and other indicators associated with the health of the stock

c) **Affirm Fluctuations.** To acknowledge that conservation decisions relate to stocks that are subject to natural fluctuations within a dynamic and complex eco-system

Figures are in 000t

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001*
TAC	30	20	17.5	14	12.5	12	26	26	15	13	9	11	13	9.3	7	6	6
Catch	20	19.2	18.5	19.1	19.4	22.7	26.7	25.5	15.8	13.1	8.8	10.6	11.5	8.28	7.11	5.9	4.58

*Canadian Catch as of Dec 12/01

1. Figures are from the Integrated Fisheries Management Plan Atlantic Groundfish

The FRCC and fishermen in 4X5Y are continuing their work toward applying these objectives in the mixed cod and haddock fisheries in 4X5Y.

Analysis

There was no assessment of this stock in 2001. The 2000 Stock Status Report and the 2001 groundfish update reported:

- Landings after 1997 have been among the lowest on record.
- Exploitation rate on fully recruited ages 4 and 5 has declined from the high of 60% in 1992, and is estimated to be about 23% in 1999 and near the $F_{0.1}$ target of 17% in 2000 and 2001.
- Spawning stock biomass (ages 4-8) in 2000 is estimated to be at a low level (about 20,000t) and has been stable around this level since 1993.
- For removals of 6,000t in 2001/2002, there is a 50% chance of a 20% increase in 4+ biomass to 2002 due to improved anticipated recruitment of the 1998 year class (age 4 in 2002).

Sources

DFO Science

SSR A3- 05 (2000) Southern Scotian Shelf and Bay of Fundy Cod (Div. 4X/5Y).

SSR A3-35 (2001) Update on Selected Scotian Shelf Groundfish Stocks in 2001.

FRCC Consultations

Barrington, NS (November 19)
Port Hawkesbury, NS (November 20)
Dartmouth, NS (November 21)

Written Briefs

Shelburne County Competitive Fishermen's Association – Pam Decker (2001-010-00225)

Inshore Fisheries Limited – Claude d'Entremont (2001-010-00228)

Scotia Fundy Mobile Gear Fishermen's Association – Brian Giroux (2001-010-00232)

Scotia Fundy Inshore Fishermen's Association – Evan Walters (2001-010-00234)

Council's Views on Stock Status

Overall stock Indicator:	rebuilding toward the target of 40,000t SSB by 2003
	Compared to average
Spawning Biomass:	increasing from historically low levels; anticipated improved recruitment in 1998 and 1999 year classes
Total Biomass:	same as above
Recruitment:	well below historical average 1 year olds since 1992 but improved in recent years, especially 1998 and 1999yc
Growth and Condition:	continues to be good
Age Structure:	older ages comprise less than expected proportion of landings, VPA in 2000 likely overestimates stock over 7 years of age
Distribution:	RV survey in 2001 improved from unusual 2000 RV; 2001 ITQ survey more than doubled from 2000 to 2001
Recent Exploitation Level:	reached a high in 1992; declined since and now near target exploitation of 17% ($F_{0.1}$ level)

- The 1998 year-class is anticipated to be the strongest since 1992; initial indications are that the 1999 year-class is at least as large as 1998: this is required to approach the implied growth needed to achieve the three-year rebuilding plan. Survey indices for 2001 confirm the strength of the 1998 year-class and indicate that the 1999 year-class is also strong.
- The catch per tow in the ITQ survey more than doubled from 2000 to 2001.

The outlook presented by the 2000 assessment continues to be considerably uncertain with respect to the estimates of abundance. Fishermen believe that commercial catches of cod are not indicative of what cod may be in the water, e.g., commercial fishermen do not fish in areas where larger cod are traditionally found. They have changed their fishing patterns with respect to catching cod in 4X5Y: fixed gear and mobile gear fishermen now avoid traditional cod areas and learn to manage cod catches more as by-catch while directing for haddock.

Again this year, fixed gear fishermen in 4X5Y report that because of low relative cod quotas, cod was being taken primarily as by-catch in the directed haddock fishery despite efforts to avoid cod. Fishermen from all gear types reported that cod were caught in good condition with large, numerous cod found in the Bay of Fundy, in deep water off German Bank, around Little LaHave and off Brown's Bank – locations where the fall and winter fishery would traditionally take place. Fishermen also reported signs of small cod coming into the fishery.

Analysis of FRCC questionnaires completed by fishermen over the last two years showed that fishermen uniformly believe that 4X5Y cod had improved stock status in 2000 and again in 2001. Fishermen also consistently reported better catch rates (at lower levels of fishing effort) for cod, that cod were easier to find, and that catches gave bigger fish in good condition. As well, fishermen widely supported stock monitoring and enforcement programs in the cod and haddock mixed fishery.

Recommendations received from the industry generally recognized and supported the continuation of the multi-year 6,000t TAC for 4X cod which will be into the third and final year of the three year plan in 2002/2003.

The following recommendations are made in addition to the new and existing conservation management measures that remain in place for this stock, including the TAC, closure of the Brown's Bank spawning area (from February to June), the small fish protocol (<43cm), minimum mesh size (130mm), and enhanced dockside monitoring and observer coverage levels and strict protocols for cod by-catch in other fisheries.

Specifically, the FRCC supports DFO Fisheries Management and industry as they move toward 100% DMP in fixed gear fishery groups that are currently at 50% dockside monitoring or less. It is also noted from FRCC questionnaires, that increased DMP and at-sea boardings were suggestions from fishermen as a means to improve enforcement. Fishermen did not think that there was much misreporting of cod and haddock. Fishermen in Barrington reported that seals were present in westerly areas.

The FRCC recommends that for 2002/2003, DFO Fisheries Management, in consultation with industry, continue to review enforcement measures to ensure that dumping, discarding, and misreporting does not take place in this fishery (such as increased levels of at-sea boarding and sampling, dockside monitoring, and observer coverage at sea and make changes where necessary).

The FRCC reiterates its strong support for the efforts of DFO Science to carry out a cod tagging program in order to learn more about in-season cod movement, substocks, and possible spawning locations and timing in 4X5Y. Extension of the current program to include the joint industry-DFO ITQ survey would provide wider results for future analysis.

The FRCC recommends that DFO Science, in consultation with industry provide a report on the tagging program in 4X5Y, on information about seasonal cod (and other groundfish) migration patterns and spawning location and dynamics.

Recommendations from the industry generally recognized and supported the continuation of the multi-year 6,000t TAC for 4X cod which will be into the third and final year of the three year plan in 2002/2003. Given the conditions placed on the three year plan for 2000-2003 established in 1999 by the Minister, and in particular, the anticipated level of growth in the spawning stock biomass to 40,000t by the end of the three year fishing period in 2003, **the FRCC recommends that a stock assessment for 4X5Y cod be carried out during the fall 2002 Regional Assessment Process.**

HADDOCK - 4TVW

PERSPECTIVE

This stock is located primarily in 4VW along the north-eastern portion of the Scotian Shelf. The fishery had reported catches in the 10-20,000t range throughout the 1950s and 1960s. Fishing mortality reached excessive levels and catches declined to average about 5,000t in the 1970s. There was a period of recovery in the 1980s, when fishing mortality declined by half (though still remaining almost twice $F_{0.1}$ levels) and catches averaged about 11,000t. The directed fishery was closed following FRCC advice in 1993, and the fishery has remained closed since then. It appears that fishing alone was not the cause of the precipitous drop in stock biomass and in the growth rate of the fish. Harsh environmental conditions appear to have contributed to these declines. In 1999, environmental conditions returned to more normal ranges. In the late 1990s a series of good to extraordinary year-classes recruited to the stock.

A significant feature of this stock and its habitat is the presence of a large closed area covering much of Emerald and Western Banks (i.e. the haddock box). This closed area was implemented in 1993 to encompass what were considered to be major juvenile haddock areas. While the boundary of the area has been debated in relation to its effectiveness as a juvenile haddock protection measure, it remains as a significant 'no-take zone' that protects both juvenile and adult haddock.

ANALYSIS

A full assessment of this stock was conducted by DFO Science in 2001, the first full assessment since 1997. The assessment utilized data to the beginning of 2000, and concluded that both total abundance and spawning stock biomass have increased significantly since the closure. Total abundance (age 2+) is at the highest in the time series; over twice the 1970-2000 average. Spawning stock biomass is slightly above the 1970-2000 average, and at the beginning of 2000 was about 2/3 of the 1948-2000 average. Recruitment since 1995 has been good to extraordinary. Geographic distribution (area occupied and density) of fish under 30 cm is at or above the 1970-2000 average, while that for fish over 30 cm has been stable or declining since the mid-1980s with larger fish concentrated on the offshore banks. Bottom temperature conditions over the past three years have been at or above the 1961-1990 average. Total mortality is calculated to have averaged 0.35 since the mid-1980s. Since fishing mortality is very low, natural mortality would therefore be substantially higher than the 0.2 assumption in past assessments. Since 1993, adult haddock body weight has been below average in seven out of nine years. The growth rate of age 3+ fish ranges from 10-30% below the 1970-85 average and has been relatively stable since 1995. This has negatively impacted the rebuilding of the 'fishable' biomass, defined in terms of the current 43 cm minimum fish size, which at beginning of year 2000 was less than half the 17,000t 1970-2000 average.

In November 2001, the FRCC conducted public consultations in Barrington, Port Hawkesbury, and Dartmouth, Nova Scotia. Written submissions were also received. Most comments on this stock supported the conclusion that haddock has been more abundant in recent years. There is no apparent difference between the views of industry and the results of the 2001 assessment. Industry representations also included a request for the FRCC to consider a limited reopening of a directed haddock fishery, and a request for a review of whether the target of 100% maturity of female haddock can be maintained and a loss of potential yield can be avoided through a lowering of the minimum fish size for this stock.

The Council holds the view that consideration of the option of having a limited directed commercial fishery in the near future requires addressing various interrelated issues. These issues include: the apparent continuation of low growth rates that are resulting in a relatively low 'fishable' biomass; the 43cm minimum fish size associated with the 'fishable' biomass in relation to 100% female sexual maturity being reached at 39cm; the balance between potential loss of short to

Figures are in 000t

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001*
TAC	15	17	by-catch		6.7	6	by-catch					Moratorium					
Catch	11.9	16.3	4.2	3.9	9.1	6.8	5.8	5.9	1.2	0.09	0.09	0.10	0.06	0.12	0.08	0.08	0.07

*Canadian Catch as of Dec 12/01

1. Figures are from the Integrated Fisheries Management Plan Atlantic Groundfish

longer term yield and the impact (if any) of lowering the minimum fish size on an interim basis; and, the balance between harvesting the economic value that can and should accrue from the haddock resource and the need to minimize the negative impact resulting from the associated by-catch of cod. Accordingly, it appears prudent to address the aforementioned issues prior to a decision to have any directed fishery.

The FRCC recommends that there be no directed fishery for haddock in 4TVW in 2002/2003, subject to initiatives outlined below.

The FRCC recommends that by-catches of haddock in 4TVW should not exceed those required for the normal conduct of fisheries directed towards other species, subject to initiatives outlined below.

The biomass of age 2 fish (1998 year-class) is estimated to be about 38,000t at the beginning of 2000. Based on current maturity rates, it may be expected that fish from this year class have now been added to the total spawning stock biomass that was 26,000t at beginning of year 2000. It may not be unreasonable to expect therefore that the 1948-2000 average spawning stock biomass has now been exceeded.

Sources

DFO Science

SSR A3-35 (2001) Eastern Scotian Shelf Haddock (Div.4TVW)

Draft Research Document: Assessment of the Status of Div. 4TVW Haddock: 2000

FRCC Consultations

Barrington, NS (November 19)
Port Hawkesbury, NS (November 20)
Dartmouth, NS (November 21)

Written Briefs

Eastern Nova Scotia 4VsW Management Board - Nellie Baker Stevens (2001-010-00233)

Council's Views on Stock Status

Overall Stock Indicators:	very strong rebuilding pulse; concern with poor growth rate and apparently high natural mortality rate
	Compared to average
Overall Abundance (age 2+):	highest in time series; over double the 1970-2000 average
Spawning Biomass:	healthy; probably above 1948-2000 average
Recruitment:	good to extraordinarily good since 1995
Age Structure:	3+ biomass reasonably spread over 5 year classes; opportunity for large and sustained increase in SSB to flow from extraordinary 1998 year-class and early indications of strong 1999 year-class
Growth Rate:	poor; not as bad with younger fish / worse with older fish, age 3+ fish in range of 10-30% below 1970-85 average; relatively stable since 1995
Condition: (length to weight ratio)	30 cm and 45 cm fish below but within 5% and 10% of 1979-99 average respectively
Distribution:	stable or above the 1970-2000 average; stable or declining since the mid 1980s
Recent Exploitation Level:	very low at 0.003

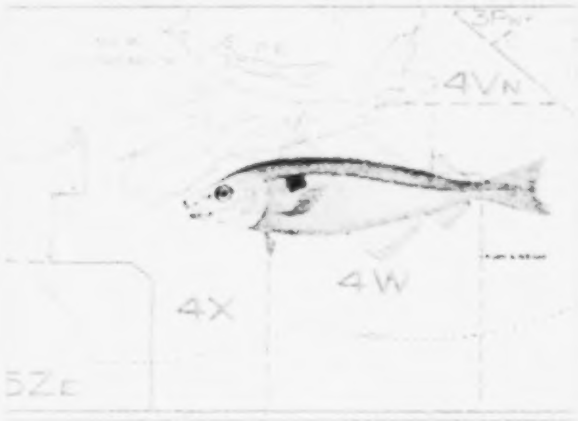
The FRCC recommends that DFO Fisheries Management and Science and industry work with the FRCC over the coming months towards the development of a long-term Fisheries Resource Conservation Plan (FRCP) for 4TVW Haddock prior to the end of 2002.

In addition to this FRCC initiative, it is important for there to be a concerted effort among DFO and industry to address some of the unresolved issues that have implications of both an operational and policy nature.

The FRCC recommends the establishment of a working group led by DFO Fisheries Management, and to include DFO Science and industry, to explore the following issues and to provide input by September 2002 towards the development of the FRCP for this stock:

- **to evaluate the impact of reduced growth rate and various harvest strategies on potential short and longer term yields to be derived from the fishery,**
- **to evaluate potential adjustments to the 43 cm minimum fish size in relation to other alternative levels including the 39 cm average length for 100% female maturity,**
- **to design and implement test fishing projects (with appropriate observer coverage),**
- **to evaluate the ability of industry sectors to minimize cod by-catch while directing towards 43 cm/39cm haddock, and to consider other matters as the working group may identify.**

HADDOCK - 4X5Y



PERSPECTIVE

Haddock is a bottom dwelling species that feeds mainly on small invertebrates. Haddock grow rapidly at young ages reaching an average length of 43cm and average weight of 0.8kg by age 3, the age of 50% female maturity. The fecundity of females at first maturity is low then increases dramatically with age. The major spawning area for the stock is on Browns Bank where peak spawning may occur between April and June. After age 3, growth rate slows with haddock reaching an average of 66cm in length by age 10.

Reported haddock landings since 1988 have been below 11,000t annually. Historically, this fishery has been dominated by mobile gear (trawlers) except during 1990-93 when the proportion of landings taken by fixed gear (longline and handline) was greater. Quotas for this stock were introduced in 1970 and the Browns Bank spawning closure of from February 1 to June 15 each year has been in effect since that time.

Smaller handline vessels fish primarily May to September. The ITQ fleet (MG<65') adapts its fishing strategy to available quotas and is now more seasonal in fishing pattern depending on quota availability and market. The small fixed gear fleets fish primarily in June and July with more large vessel (>65' LOA) and ITQ participation during the fall period.

INTERIM STOCK OBJECTIVES

The Council has made recommendations for 4X5Y haddock based on the following objectives for this stock. These objectives and conservation measures for 4X5Y haddock are being discussed with 4X5Y fishermen toward the development of a long-term Fisheries Resource Conservation Plan for this stock. The objectives are:

A. Conservation and Rebuilding of Commercial Groundfish Stocks

a) **Ecosystem Health**. To prevent or to mitigate human disturbances of species diversity, genetic variability, ecosystem productivity, structure, and function, and marine environmental quality

b) **Rebuild.** To rebuild the spawning stock biomass (ages 4+) to the targeted range

c) **Conserve.** To identify, monitor, and avoid over-exploitation of individual spawning stock components and juvenile rearing areas within the management area

d) **Research.** To investigate, monitor and establish guidelines regarding the reproductive capacity of the stock, substock components, and interactions with the ecosystem

B. Sustainable Utilization and Relative Stability in the Fishery and Management Regime

a) **Sustainable use.** To maintain the ecosystem resources for the use of future generations

b) **Long-term view.** To adopt a longer-term view of stock management linked to spawning stock biomass levels and other indicators associated with the health of the stock

c) **Affirm Fluctuations.** To acknowledge that conservation decisions relate to stocks that are subject to natural fluctuations within a dynamic and complex eco-system

The FRCC and fishermen in 4X5Y are continuing their work toward applying these objectives in the mixed cod and haddock fisheries in 4X5Y.

ANALYSIS

There was no assessment of this stock in 2001. The 1999 Stock Status Report and the 2001 groundfish update reported:

- Biomass abundance and recruitment are above average.
- Both the 1993 and 1994 year classes dominated age composition of 1999 landings (48%). The 1997, 1998 and 1999 year classes are strong.

Figures are in 000t

Year	1986	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001*
TAC	15	15	15	12.4	4.6	4.6	0	0	5	4.5	6	6.5	6.7	6.1	8.1	8.1	8.1
Catch	15.3	15.3	13.7	11	6.9	7.4	10	10.2	6.6	4.41	5.67	6.19	6.50	7.88	9.11	7.90	5.04

*Canadian Catch as of Dec 12/01

1. Figures are from the Integrated Fisheries Management Plan Atlantic Groundfish

- Exploitation rate for ages 5-7 decreased from approximately 50% in the early 1980s and dropped below $F_{0.1}$ from 1994 through 1997. The exploitation rate in 1998 through 2001 are near the target rate of 20%.
- The projected yield at $F_{0.1}$ in the year 2001 would be about 8,600t above the actual TAC of 8,100t.
- If fished at $F_{0.1}$ in the year 2001, the spawning stock biomass is projected to increase to 39,000t and then decline slightly to 37,000t in 2002.
- Geographic distribution and area occupied is large and haddock are widespread.
- Mean lengths at age and condition have improved in 2000 but remain below the long term average.

Fishermen from both fixed and mobile gear sectors have made significant progress in directing for haddock with minimal by-catch of cod in what was previously predominantly a mixed cod-haddock fishery. The FRCC recognizes the effort made by industry to conduct a clean haddock fishery and encourages continued innovation in the harvesting of this resource in a responsible manner.

Status quo at the 2000-2001 TAC level should continue the ongoing rebuilding of the stock given the improved numbers of recruits, and should achieve more sustained future benefits for industry. Achievement of a broad age structure in the population, enhancement of the population of older, more productive spawners, and recovery of weights-at-age are realistic medium term objectives for this stock. The upturn in 2001 of haddock condition reinforces optimism in the stock. Continued spawning stock biomass increases are

Sources

DFO Science

SSR A3-07 (1999) Southern Scotian Shelf and Bay of Fundy Haddock

SSR A3-35 (2001) Updates on Selected Scotian Shelf Groundfish Stocks in 2001

FRCC Consultations

Barrington, NS (November 19)
Port Hawkesbury, NS (November 20)
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Written Briefs

Shelburne County Competitive Fishermen's Association – Pam Decker (2001-010-00225)

Inshore Fisheries Limited – Claude d'Entremont (2001-010-00228)

Scotia Fundy Mobile Gear Fishermen's Association – Brian Giroux (2001-010-00232)

Scotia Fundy Inshore Fishermen's Association – Evan Walters (2001-010-00234)

Council's Views on Stock Status

Overall Stock Indicator:	Rebuilding toward the long-term average
	Compared to average
Spawning Biomass:	above average since the mid 1980s
Total Biomass	above average since the mid 1980s
Recruitment:	Year classes 1995 weak; 1996 above average, 1998, 1999, and 2000yc strong
Growth and Condition	Increased since 1995 but remaining below long-term mean
Age structure:	1-3 year old haddock proportion high due to strong recruitment
Distribution:	Widespread
Recent Exploitation Level:	at or below $F_{0.1}$ since 1994

dependent on the strong recruitment seen in the recent years.

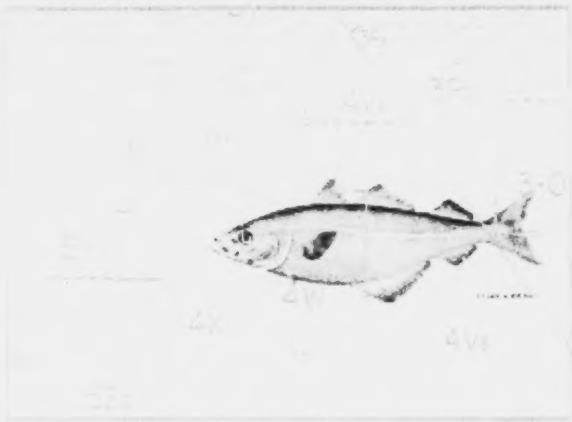
The FRCC recommends that the TAC for 4X5Y haddock be set at 8,100t in 2002/2003.

Historical biases in estimating variable recruitment and the concentration of the fishery on few year classes require ongoing caution in maintaining the sustainable potential for this fishery. The FRCC encourages ongoing strong enforcement policies in the management of the mixed cod and haddock fishery.

The FRCC recommends that management measures be enforced to protect juvenile haddock and incoming recruitment and efforts to avoid the capture of small fish be continued.

Given the conditions placed on the three year plan established in 1999 by the Minister for 4X5Y cod that ends in 2003, and because of the mixed fishery directed at haddock in 4X5Y, **the FRCC recommends that a stock assessment for 4X5Y haddock be carried out during the fall 2002 Regional Assessment Process.**

POLLOCK - 4VWX5ZC



PERSPECTIVE

Atlantic pollock range from southern Labrador to Cape Hatteras. They are semi-pelagic, schooling and strong swimming species. Young pollock are associated with inshore habitats and recruit to offshore areas in year two. Pollock mature at ages 3-5 and show marked differences in growth rate by area. Food of adult pollock include euphausids, herring, sand lance and silver hake. Pollock are fished with fixed gear long lines and gill nets as well as mobile otter trawls. They are often taken as a by-catch in small mesh fisheries.

Landings averaged 40,000t from 1980-1989, dropped to 24,000t from 1990-1996, and then dropped to approximately 5000t in recent years. TAC levels established in the early 1970's and which have also gradually declined from 40,000t to 10,000t have rarely been caught.

ANALYSIS

The most recent full assessment was conducted in 1999, and the 2001 groundfish update provided by DFO Science states:

- Catch rates in the standardized catch rate series in 2001 remain at a low level comparable to 1999 and 2000. The catch was dominated by age 3 fish (1997 year class).
- The 1997 year class is moderately strong and recruiting to the fishery. The 1999 year class may also be stronger than recent year-classes.
- The 2001 ITQ survey caught large numbers of age 2 fish (1999 year class) compared with the 10 year average, and also showed fewer fish larger than 70cm compared to 1995 - 1998.
- Catch rates remain comparatively low, there are few large fish, and the fishery remains spatially restricted toward the west.
- Catches at the current level of approximately 6000t will likely permit rebuilding.

The FRCC held public consultations on this stock in Barrington (November 19), Port Hawkesbury (November 20) and Dartmouth, Nova Scotia (November 21). All industry comments were in very strong support of retention of the 10,000t TAC.

Landings in the mobile fleet sector have been low the past few years resulting in the overall TAC not being caught. This is primarily related to fisheries management, fleet sector allocations and harvesting strategies. However, fixed gear fishers reported average to good fishing in western areas resulting in TAC allocations generally being caught.

It was noted by industry that the poor overall pollock landings in 2000/2001 were a result of a number of factors. These include depressed market prices for pollock, the lack of any pollock fishing effort by some quota holders in the mobile sector, and pollock grounds being closed to directed groundfish fishing in 4VW. There are also constraints placed on pollock fishing by restrictive hake and cod by-catch levels when cod and hake are said to be increasing in abundance, particularly in western fishing areas of 4X and 5. It was also stated that many traditional pollock fishers are now primarily involved in the snow crab fishery.

Fixed gear fishers in the western areas reported increased abundance of pollock in traditional areas, more size ranges and better landings overall. There were continued general observations of small pollock being numerous in inshore waters as well as reports of increased presence of pollock on Scotian Shelf, Georges Bank, Laurentian Channel and in 3Ps in other directed fisheries.

Although industry agrees that the overall condition of the stock is poor compared to the past, there are positive signs of recruitment, stock assessments are considered to be highly uncertain, and fishing effort has remained low. It was strongly stated that the difference between TAC and landings is due to management measures, fleet sector allocations and harvesting strategies and should not be a reason to reduce TAC levels.

Concerns were expressed regarding the potential of small mesh mobile redfish fishing activities in western

Figures are in 000t

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001[1]
TAC	42.4	40	43	43	43	38	43	43	21	24	14.5	10	15	20	12	10	10
Catch	43.8	44.3	46	42.9	43.7	37.9	38.5	33.7	20.8	15.3	9.8	9.2	11.9	14.4	8.8	5.5	4.5

*Canadian Catch as of Dec 12/01

1. Figures are from the Integrated Fisheries Management Plan Atlantic Groundfish

areas to harm incoming strong year classes through excessive by-catch of smaller pollock.

Following on FRCC recommendations to develop alternative methods for estimating stock abundance, a DFO/industry acoustics study commenced in 1999 and is scheduled to conclude in 2002. The substantial uncertainties of existing assessment methods render improved information regarding abundance of pollock critical. In light of the potential importance of this new method in determining abundance it is imperative this initiative be completed, evaluated and applied if possible.

Sources

DFO Science

SSR A3-13 (1999) Pollock in Div. 4VWX & SA 5

SSR A3-35 (2001) Updates on selected Scotian Shelf groundfish stocks in 2001

Res Doc 99/56 The 1999 Assessment of Pollock in NAFO Divisions 4VWX and 5ZC

FRCC Consultations

Barrington, NS (November 19)
Port Hawkesbury, NS (November 20)
Dartmouth, NS (November 21)

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Eastern Nova Scotia 4VsW Management Board – Nellie Baker (2001-010-00233)

Inshore Fisheries Ltd. – Claude d'Entremont (2001-010-00228)

Scotia Fundy Mobile Gear Fishermen's Association – Brian Giroux (2001-010-00232)

South Shore Independent Fishermen's Association – Brian Everett (2001-010-00230)

Scotia Fundy Inshore Fishermen's Association – Evan Walters (2001-010-00234)

South Shore Gillnet Fishermen's Association – John Levy (2001-010-00229)

The FRCC recommends DFO continue to support the acoustic study as a method for estimating abundance and that a report on the efficacy of adopting this approach be provided before the end of 2002.

Participants continue to point out the lack of confidence in the reliability of the assessment of this stock. Among other things marked differences in the assessment formulations such as inter-annual variations of year class estimates do not provide a consistent year-over-year perspective on stock status. Therefore, there continues to be a large degree of uncertainty about abundance of this stock. TACs established through the years 1991 through 1998 averaged 20,000t. The lowest TAC in this time series was 10,000t (1996). Setting the

Council's Views on Stock Status

Overall Stock Indicator:	likely below average, may be improving
	Compared to average
Spawning Biomass:	uncertain / below average
Total Biomass:	uncertain / below average
Recruitment:	1992-1995 year classes below average; evidence of strong year classes in 1997 and in 1999
Growth and Condition:	slight decline in weights at age reported in 1999
Age Structure:	size and age of fish diminishing reported in 1999
Distribution:	increasingly constricted reported in 1999, may now be expanding
Recent Exploitation Level:	unknown

TAC equal to the lowest level of the past 10 years is indicative of severe uncertainties in estimating stock status, generally declining indices of abundance, and shifts in stock distribution. There is also continued evidence of strong incoming year classes. However, information made available to the Council in 2001 indicates little overall change in the condition of the stock, and provides no basis for a change in the TAC recommendation made last year.

The FRCC recommends that the TAC for 4VWX5Zc pollock be set at 10,000t in 2002/2003.

It should be noted that in the absence of adopting a new and effective survey technique, and/or unless more positive information towards the objective of stock rebuilding becomes apparent within the next year or two, the Council may have no alternative but to recommend a reduction of the TAC below the current level in the near future. Uncertainties associated with the overall abundance and condition of the stock suggests that measures be continued to avoid having a disproportionate amount of the catch coming from a small area rather than being spread throughout the management area.

The FRCC recommends that DFO continue to report on pollock catch levels by subarea.

The FRCC further recommends that DFO and industry should ensure that effort is not disproportionately directed towards any one subarea of the management unit.

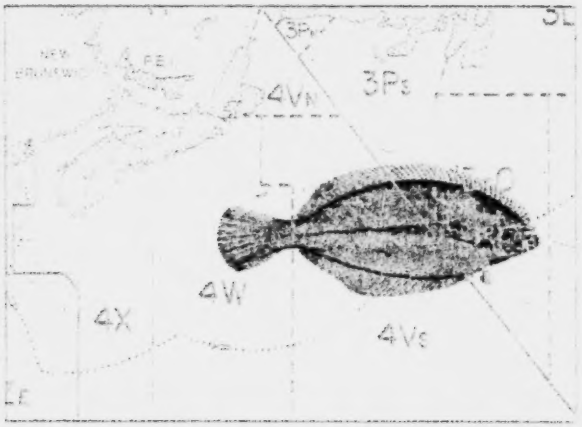
There are indications that a moderately strong 1997 year class is recruiting to the fishery. The 1999 year class also appears strong. Due to the condition and lack of mature spawning fish in the population, these incoming year classes represent the greatest potential for rebuilding the pollock stock. Effective management measures must be considered to protect these year classes until they have the opportunity to make a significant contribution to the spawning stock biomass and to broaden the age structure of this stock.

The FRCC recommends that DFO and industry develop and implement an action plan to ensure that fishing effort in at least the 2002 through 2004 period ensures that harvest levels on the 1997 and incoming 1999 year classes* remain conservative enough to allow rebuilding of this stock.

*Subsequent otolith aging has determined that fish identified as the 1998 year class in 2000 is the 1999 year class.

The FRCC recommends that DFO in conjunction with industry identify probable areas of high concentrations of small pollock and implement temporary closures to directed pollock fishing, and that excessive amounts of small pollock are not harvested through other fisheries (e.g. small mesh redfish fisheries and herring weirs).

FLATFISHES - 4VW



PERSPECTIVE

Flatfish are bottom dwelling fishes primarily associated with mud and sand bottom. They are unique among other fish in being asymmetrical, both eyes lying on one side of a highly flattened body. Early in life they start swimming on one side, and the eye on the underside migrates to the upper side. Flatfish lie on the bottom on their blind side. Their principal food items include crustaceans, molluscs, polychaete worms and small fishes.

There is much localized variation in species mix associated with depth and temperature. Although the winter flounder, American plaice, and yellowtail flounder populations on the Scotian Shelf have been divided into 4VW and 4X5Y management units, the biological basis for that separation has yet to be established.

American Plaice: The spring, summer and fall RV surveys (1978-84) indicate that the major concentration of this species occurs in 4VW throughout the year, with a continuous distribution over the Scotian Shelf. The distribution of pre-recruits (<31cm) fish during the summer RV surveys, (1993-97) suggests distribution in both 4X and 4W; larger fish are not abundant in 4X, particularly in the Bay of Fundy. Concentrations occur in the deeper water just inshore of Browns Bank. This distribution is also indicated by the ITQ survey which caught very few plaice in the Bay of Fundy, but consistently caught them inshore of Browns Bank, and in lesser numbers, up to the 4X-4W boundary. American plaice is a deeper water species than winter flounder or yellowtail flounder, and is seldom caught in shallow water stations of the RV or ITQ surveys.

Yellowtail flounder: The spring, summer and fall RV surveys indicate the major concentration of this species occurs in 4VW throughout the year, with minor concentrations in the areas of Browns Bank and the Bay of Fundy. All three surveys indicate some differences between the distribution in 4VW and 4X5Y, as well as between Browns Bank and the Bay of Fundy. The summer RV surveys (1993-97) indicate similar distributions of juvenile and adult fish.

The current mesh size regulation for directing for 4VW flatfish is 155mm square. The 155mm square mesh is an increase from previous years and was implemented in part to try to ensure that the proportion of witch flounder in the catch of flatfish did not exceed current levels and in order to protect incoming recruitment.

ANALYSIS

The flatfish stocks were not assessed in 2001.

4VW Flatfish

The 2000 stock assessment produced a stock status report for American plaice and yellowtail flounder on the Eastern Scotian Shelf (Div. 4VW).

The 2000 SSR indicated that for 4VW American plaice:

- The abundance and condition of fishery sizes of American plaice is very low.
- There should be a reduction in fishing mortality on American plaice until an increase in production is observed.

The 2000 SSR indicated that for 4VW Yellowtail flounder:

- Fishery-sized yellowtail flounder are no longer available in either of the two areas of concentration (4Vs and 4W).
- Yellowtail flounder pre-recruit abundance has been improving, but with no evidence of a contribution to the fishable biomass. Until this happens, there are no prospects of improved yields.

Winter flounder in 4VW, the abundance remains relatively high and it is not fished commercially.

The 4VWX Witch flounder stock was assessed in 1997 separately from other flatfish. The 1997 Stock Status Report and 2001Groundfish Update indicate that:

Figures are in 000t

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001*
TAC										5.5	4.125	3.5	3	3	3	3	3
Catch	7.7	7.4	8.9	7.3	7.7	7.2	5.6	5.3	4.2	3.5	2.3	2	2	1.90	2.03	0.91	0.65

*Canadian Catch as of Dec 12/01

1. Figures are from the Integrated Fisheries Management Plan Atlantic Groundfish

Council's Views on Stock Status (4VW American plaice)

Overall Stock Indicator:	low and declining
	Compared to average
Spawning Biomass:	low
Total Biomass:	low
Recruitment:	confirmed signs of recruitment
Growth and Condition:	no particular observation
Age structure:	shift toward smaller fish
Distribution:	species specific
Recent Exploitation Level:	relative fishing mortality increased since 1995

Council's Views on Stock Status (4VWX Witch Flounder)

Overall Stock Indicator:	low-Medium
	Compared to average
Spawning Biomass:	low
Total Biomass:	average
Recruitment:	strong, improved since 1993
Growth and Condition:	no particular observation
Age structure:	good for pre-recruits; older ages low
Distribution:	average
Recent Exploitation Level:	unknown

- Fishable population declined from 1980s levels to low of 1992-93, remaining low at present.
- Pre-recruits highly localized in Gully and deep holes north of Banquereau Bank in 4VsW.
- Avoid increased effort on witch, to protect incoming recruitment and allow rebuilding.
- Likely some linkage with stocks to north and east.
- Recruitment since 1993 has been stronger than in earlier periods, peaking in 1997.

The information in the 2001 update of the SSR shows continuing indications of stock decline for American

Council's Views on Stock Status (4VW yellowtail flounder)

Overall Stock Indicator:	low and declining
	Compared to average
Spawning Biomass:	maturity under the market size
Total Biomass:	relatively low
Recruitment:	relatively high numbers of pre-recruits
Condition:	no clear trends over years
Growth:	appear to live full life cycle under fishery size
Age structure:	no reliable ageing, high #'s pre-recruits; fishery-sized lowest observed
Distribution:	contraction of distribution
Recent Exploitation Level:	relative fishing mortality approx. zero since 1997

plaice and yellowtail flounder and suggests that fishing mortality on flatfishes in 4VW be reduced until there is an increase in abundance.

Some fishermen who had fished 4VW flatfish for 30 years were still experiencing high catch rates, and found witch flounder to be plentiful; however, these fish were still too small for market. Conflicts with the ever increasing amount of crab gear, otter trawl vessels switching to more lucrative crab fishing, and generally low flatfish prices were reasons given why the TAC was not fully caught recently. Fishermen expressed their opinion that the three flatfish species should not be split in individual TACs because operationally, it could create a redirection of effort and potential for discarding. In 4Vn, industry participants felt that the 4VW yellowtail may be fished separately from the other two species.

Fishermen observed that when seismic exploration for oil and gas took place while they were fishing, bottom dwelling species, such as flatfish, appeared to leave the area only to return days or weeks later. The same seismic disturbances were experienced in the early 1980's.

The fishermen directing for 4VW flatfish did not agree with the results of the DFO scientific assessment. They felt that catch rates were down as a consequence of gear conflicts with other fisheries. Other participants felt that the flatfish stocks looked stable and stressed that the industry will be exploring ways to protect recruitment.

The Council believes that a continuation of the 3,000t TAC (for the past few years) particularly as a mixed approach to management of these stocks is not consistent with a rebuilding strategy. There is also special concern for the decline observed in American plaice and yellowtail flounder stocks. Drastic measures may be needed to prevent further stock decline, let alone institute a rebuilding strategy.

The FRCC recommends that the TAC for 4VW flatfish be set at 2,000t in 2002/2003. Without the ability to target conservation measures by species next year, it is quite likely that the overall TAC may have to be further reduced.

As it is for 4X5Y flatfishes, the FRCC is committed to conserve 4VW flatfish stocks. The first step toward accomplishing this goal is the identification of the flatfish species in catches in 4VW. This recommendation has been made repeatedly by the Council in past reports on this stock without effect: it will continue to be the focus of the FRCC's conservation measures for 4VW flatfishes until such time as progress is made on this important issue. The Council also notes that witch flounder in 4VWX is apparently able to be reported separately from other flatfishes in the region as evidence that this separation is possible for at least a small but not insignificant component of flatfishes in 4VW. Moreover, in the spirit of the Fisheries (General) Regulations, DFO should require fishermen to separate catches by species.

The FRCC recommends that catches in the 4VW flatfish fishery be recorded by species in the fishing year 2002/2003.

The FRCC is concerned that the abundance status of 4VW flatfishes overall may be compromised as long as catches are being lumped together in a grab bag of "unspecified" flatfish. The FRCC is disappointed that DFO Science and Fisheries Management in Maritimes Region seem unable to resolve their differences on species identification toward improved knowledge and conservation of flatfish stocks. The following recommendations continue to reflect the Council's view that this work must be done in consultation with industry without delay.

The FRCC recommends that DFO Science in consultation with industry provide estimates by the end of 2002 on an index of relative biomass among the 4VW flatfishes including witch flounder, American plaice, and yellowtail flounder.

Sources

DFO Science

SSR A3-19 (1997) Witch Flounder in Division 4VWX

SSR A3-34 (2000) American Plaice and Yellowtail Flounder on the Eastern Scotian Shelf (Div. 4VW)

SSR A3-35 (2001) Updates on selected Scotian Shelf groundfish stocks in 2001

FRCC Consultations

Barrington, NS (November 19)
Port Hawkesbury, NS (November 20)
Dartmouth, NS (November 21)

Written Briefs

No briefs received.

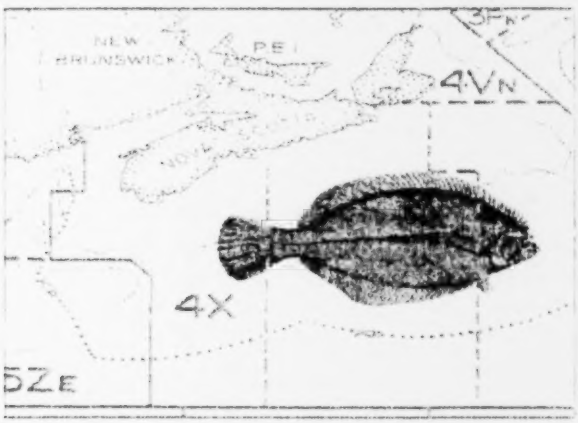
The relative biomass of the various 4VW flatfishes and other available information (e.g., relating to the operation of the fishery) can be used to establish stock status on individual flatfish species and allow the FRCC to recommend stock-by-stock measures for the conservation of these resources in the future.

The FRCC recommends that DFO Science and Fisheries Management in consultation with industry take the necessary steps to investigate and report by the end of 2002 on the practicality of directing specific conservation measures on these individual flatfish species.

Fishermen reported that there was a problem with small fish in the 2000-2001 catch.

The FRCC recommends that minimum size limits be enforced to protect incoming recruitment and efforts to avoid the capture of small fish be continued.

FLATFISHES - 4X5Y



PERSPECTIVE

Flatfish are bottom dwelling fishes primarily associated with mud and sand bottom. They are unique among other fish in being asymmetrical, both eyes lying on one side of a highly flattened body. Early in life they start swimming on one side, and the eye on the underside migrates to the upper side. Flatfish lie on the bottom on their blind side. Their principal food items include crustaceans, molluscs, polychaete worms and small fishes.

There is much localized variation in species mix associated with depth and temperature. Although the winter flounder, American plaice, and yellowtail flounder populations on the Scotian Shelf have been divided into 4VW and 4X5Y management units, the biological basis for that separation has yet to be established.

Winter flounder: The distribution of winter flounder in spring, summer, and fall from the 1978-84 RV surveys indicates two or three areas of concentration, with the largest and most consistent concentration in the Bay of Fundy, the second on Sable Island Bank and a smaller one on Browns Bank. Further examination of these concentrations using the 1993-97 summer RV surveys indicates that, while adult (>27cm) winter flounder are found in all three areas, juveniles are found only in the Bay of Fundy and Sable Island Bank. Data collected in the 1995-97 ITQ surveys show a continuous distribution from the Bay of Fundy across to Lobster Bay to Browns Bank. The Lobster Bay area is not sampled by the RV survey, giving the incorrect impression of the break in distribution. This suggests a connection between the Bay of Fundy and Browns Bank, but no relation with the Sable Island Bank (4W) concentration. An inshore survey conducted in 1985 indicates that quantities of winter flounder at depths under 60 m, much shallower than the areas surveyed by either the ITQ or RV surveys. Winter flounder have generally been thought to exist as numerous small inshore populations. The observations from the research surveys are not inconsistent with that view, but they do not provide sufficient detail on the distribution to further resolve that issue. The absence of evidence of winter flounder connecting eastern 4X with the western 4W suggest that the current management split is still appropriate for this species.

American plaice: The spring, summer and fall RV surveys (1978-84) indicate that the major concentration of this species occurs in 4VW throughout the year, with a continuous distribution over the Scotian Shelf. The distribution of pre-recruits (<31cm) fish during the summer RV surveys, (1993-97) suggests distribution in both 4X and 4W; larger fish are not abundant in 4X, particularly in the Bay of Fundy. Concentrations occur in the deeper water just inshore of Browns Bank. This distribution is also indicated by the ITQ survey which caught very few plaice in the Bay of Fundy, but consistently caught them inshore of Browns Bank, and in lesser numbers, up to the 4X-4W boundary. American plaice is a deeper water species than winter flounder or yellowtail flounder, and is seldom caught in shallow water stations of the RV or ITQ surveys.

Yellowtail flounder: The spring, summer and fall RV surveys indicate the major concentration of this species occurs in 4VW throughout the year, with minor concentrations in the areas of Browns Bank and the Bay of Fundy. All three surveys indicate some differences between the distribution in 4VW and 4X5Y, as well as between Browns Bank and the Bay of Fundy. The summer RV surveys (1993-97) indicate similar distributions of juvenile and adult fish.

The flatfish fishery is mainly a trawl fishery: the fixed gear component and the mobile gear vessels 65'-100' have relatively small allocations in 4X5Y.

The current mesh size regulation for directing for 4X5Y flatfish is 155 mm square, although much of the flatfish catch is a by-catch of the haddock, pollock, or mixed groundfish fishery which has a mesh size regulation of a minimum of 130 mm square. The 155 mm square mesh is an increase from previous years and was implemented in part to try to ensure that the proportion of witch flounder in the catch of flatfish did

Figures are in 000t

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001*
TAC										4.5	3.375	3.375	3	2	2	2	2
Catch	3.92	5.59	4.28	4.65	3.33	6.1	5.8	5.9	4	2.64	2.5	2.46	2.01	1.6	1.7	1.6	1.39

*Canadian Catch as of Dec 12/01

1. Figures are from the Integrated Fisheries Management Plan Atlantic Groundfish

Council's Views on Stock Status (4VWX Witch flounder)

Overall Stock Indicator:	low-medium, rebuilding (unchanged)
Compared to average	
Spawning Biomass:	low
Total Biomass:	average
Recruitment:	strong, improved since 1993
Growth and Condition:	no particular observation
Age Structure:	good for prerecruits; older ages low
Distribution:	average
Recent Exploitation Level:	unknown

Council's Views on Stock Status (Winter flounder)

Overall Stock Indicator:	stable (unchanged)
Compared to average	
Spawning Biomass:	near long-term mean
Total Biomass:	near long-term mean
Recruitment:	improving
Growth and Condition:	no particular observation
Age Structure:	unknown
Distribution:	unknown
Recent Exploitation Level:	unknown

Council's Views on Stock Status (4X5Y American plaice)

Overall Stock Indicator:	declining
Compared to average	
Spawning Biomass:	below long-term mean
Total Biomass:	below long-term mean
Recruitment:	not sustaining
Growth and Condition:	no particular observation
Age Structure:	unknown
Distribution:	unknown
Recent Exploitation Level:	unknown

Council's Views on Stock Status (Yellowtail flounder)

Overall Stock Indicator:	medium (unchanged)
Compared to average	
Spawning Biomass:	near long-term mean
Total Biomass:	near long-term mean
Recruitment:	dramatic increase in 2001
Growth and Condition:	no particular observation
Age Structure:	unknown
Distribution:	unknown
Recent Exploitation Level:	unknown

not exceed current levels and in order to protect incoming recruitment.

Of continuing concern is the "unspecified" portion of the catch; in 1993 that component represented over 80% of the catch. Although the decline in the proportion "unspecified" since 1993 is encouraging, stock assessments use both current and historical catch data in evaluating resource status. Without reliable catch data, any calculations on exploitation will contain high and unquantifiable levels of uncertainty.

Analysis

The 1997 Stock Status Report and Groundfish Update in 2001 indicate that:

- Given efficiency increases, declines in catch rates may under-estimate stock declines.
- The precautionary approach implies immediate action is needed to reduce fishing effort on 4X flatfish (could be done by lowering the TAC so landings in 1998 are less than those in 1996).
- Fishing effort should be spread proportionately among species.
- Current information indicates stability in stock status in recent years at about the long-term mean.
- In 2001, mixed set of stock scenarios: worsening situation for American plaice, improving situation for yellowtail flounder, relative stability for winter flounder.

4X Winter flounder

- RV survey indicates that the declining trend in abundance of winter flounder, evident in 1998-1999, was reversed in 2000 with a high abundance estimate, and lower, but stable in 2001

4X American plaice

- Large pulse of young American plaice in 1999 not sustained in the population; RV survey indicates declining abundance in 2001.

4X Yellowtail flounder

- Dramatic rise in abundance index from RV survey since 1999 to set record high in 2001.

The 4VWX Witch flounder stock was assessed in 1997 separately from other flatfish. The 1997 Stock Status Report and Groundfish Update in 2001 indicate that:

- Fishable population declined from 1980s levels to low of 1992-93, remaining low at present.
- Pre-recruits highly localized in Gully and deep holes north of Banquereau Bank in 4VsW.
- Avoid increased effort on witch, to protect incoming recruitment and allow rebuilding.
- Likely some linkage with stocks to north and east.
- Recruitment since 1993 has been stronger than in earlier periods, peaking in 1997.

The winter flounder and yellowtail stock abundance are above average and while American plaice appears to be declining, this stock is apparently not being targeted by the fishery. Industry participants expressed the view that the stock status appears stable but at low levels.

The overall information in the 2001 updated stock status report notes increasing weight per tow in the RV survey, stronger recruitment, and improved size composition. While this information continues to support a positive view of recovery, the short term outlook for the stock remains unchanged. On the basis of the overall science data about 4X5Y flatfishes, the Council is recommending continued caution through the status quo.

The FRCC recommends that the TAC for 4X5Y flatfish be set at 2,000t for 2002/2003.

As it is for 4VW flatfishes, the FRCC is committed to conserve 4X5Y flatfish stocks. The first step toward accomplishing this goal is the identification of the flatfish species in catches in 4X5Y. This recommendation has been made repeatedly by the Council in past reports on this stock without effect: it will continue to be the focus of the FRCC's conservation measures for 4X5Y flatfishes until such time as progress is made on this important issue. The Council also notes that witch flounder is apparently able to be reported separately from other flatfishes in the region as evidence that this separation is possible for at least a small but not insignificant component of flatfishes in 4X5Y. Moreover, in the spirit of the Fisheries (General) Regulations, DFO should require fishermen to separate catches by species.

The FRCC recommends that catches in the 4X5Y flatfish fishery be recorded by species in the fishing year 2002/2003.

The FRCC is concerned that the abundance status of 4X5Y flatfishes overall may be compromised as long

as catches are being lumped together in a grab bag of "unspecified" flatfish. The FRCC is disappointed that DFO Science and Fisheries Management in Maritimes Region seem unable to resolve their differences on procedures for species identification leading toward improved knowledge and conservation of the flatfish stocks. The following recommendations continue to reflect the Council's view that this work must be done in consultation with industry without delay.

The FRCC recommends that DFO Science in consultation with industry provide estimates by the end of 2002 on an index of relative biomass among the 4X5Y flatfishes including witch flounder, winter flounder, American plaice, and yellowtail flounder.

The relative biomass of the various 4X5Y flatfishes and other available information (e.g., relating to the operation of the fishery) can be used to establish stock status on individual flatfish species and allow the FRCC to implement stock-by-stock measures for the conservation of these resources in the future.

The FRCC recommends that DFO Science and Fisheries Management in consultation with industry take the necessary steps to investigate and report by the end of 2002 on the practicality of directing specific conservation measures on these individual flatfish species.

Sources

DFO Science

SSR A3-21 (1997) Southwest Nova Winter Flounder, American Plaice & Yellowtail Flounder

SSR A3-35 (2001) Updates on selected Scotian Shelf groundfish stocks in 2001

FRCC Consultations

Barrington, NS (November 19)
Port Hawkesbury, NS (November 20)
Dartmouth, NS (November 21)

Written Briefs

Scotia Fundy Mobile Gear Fishermen's Association – Brian Giroux (2001-010-00232)

Silver Hake - 4VWX

Perspective

Silver hake is a bottom dwelling member of the gadoid family, found from Cape Hatteras to the Grand Banks and the Gulf of St. Lawrence. A major concentration of silver hake occurs on the Scotian Shelf.

Scotian Shelf silver hake are generally found between 7 and 10 deg. C., in deeper water on the shelf edge and Emerald and LaHave basins. Seasonal movements occur as silver hake feed primarily on invertebrates, with krill the predominant prey item. Older silver hake eat fish and exhibit a high degree of cannibalism.

Silver hake have relatively rapid growth with females growing faster than males. Maximum age is 12 years. Maturity is relatively early, with a majority of males maturing at age 2, and females at 3.

Prior to 1977, fishing on the Scotian Shelf was unrestricted in terms of area, mesh size and season. During this period fishing was conducted over the entire shelf, and the use of trawl mesh as small as 40mm was common. In 1977, fishing for this species was restricted to the seaward side of the Small Mesh Gear Line (SMGL), with a minimum mesh size of 60 mm (offshore). In 1994, further restrictions were introduced to minimise incidental catches of cod, haddock and pollock in the silver hake fishery. These included a repositioning of the SMGL to prevent fishing in depths less than 190 m and the mandatory use of a separator grate in the trawl. Since 1995 a fishery has been conducted by the Canadian <65' mobile gear fleet in and around Emerald and LaHave Basins and some fishing activity took place on the continental slope in 2001.

Analysis

The outlook from the last full assessment (1999) and from the 2001 groundfish update for this resource indicated that the catches should not be allowed to increase from the 1997-99 levels. Condition, length-at-age, and size at maturity are below long term averages. Recruitment prospects are mixed, with the 1999 year class above average but that of 2000 weak. Resource concentration and distribution through the geographical range are positive. Given the inconsistency of available attributes of stock status for this resource, the outlook remains the same – catches should not increase from those in 1997-1999.

Consultations on silver hake 4VWX were held in Barrington, Port Hawkesbury, and Dartmouth on November 19, 20, 21, 2001, respectively. Generally fishermen expressed the view that the silver hake stock does not seem to be in as much difficulty as is portrayed by DFO Science. Fishermen report continued good catch rates in this fishery and significant catches on the continental slope area. This fishery is almost entirely conducted by Canadian vessels that use separator grates to avoid incidental by-catches of other groundfish species. The regulated mesh size used is 55mm square and is deemed adequate to remove the young fish. During consultations the question of whether silver hake should be protected as a food fish for other groundfish species was raised. A written brief expressed the view that the TAC should increase from 20,000 to 22,000 tons.

The Council recognizes that there is much uncertainty around this stock. For example, the survey upon which the 4VWX quota is set does not include the Gulf of Maine, however the catches from this area are applied against the TAC. The USA conducts genetic testing that may shed light on stock definition and structure in this area. There has been a 20,000t TAC set for this stock in the last 2 years that is the lowest TAC level for over 30 years. RV survey biomass and abundance in the last three years is showing initial signs of rebuilding. However, the Council does not believe there is sufficient information to increase the TAC. An objective of the Council is to rebuild this stock. It has not yet been established that continuation of the TAC at even the 20,000t level will result in a sustained rebuilding trajectory. The stock's response to the current conservation regime needs to be closely monitored and evaluated for at least another year.

Figures are in 000t

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001*
TAC	100	100	100	120	135	135	100	105	75	30	45	46	50	55	30	20	20
Catch	75.48	82.68	61.71	74.37	87.99	69.73	171.3	51.23	29.76	8	17.2	26.4	16.9	23.3	20.5	14.5	14.1

*Canadian Catch as of Dec 12/01

1. Figures are from the Integrated Fisheries Management Plan Atlantic Groundfish

The FRCC recommends that the TAC for silver hake in 4VWX be set at 20,000t for 2002/2003.

Sources

DFO Science

SSR A3-09 (1999) Scotian Shelf Silver Hake

SSR A3-35 (2001) Updates on Selected Scotian Shelf Groundfish Stocks in 2001.

FRCC Consultations

Barrington, NS (November 19)
Port Hawkesbury, NS (November 20)
Dartmouth, NS (November 21)

Written Briefs

Inshore Fisheries Limited – Claude d'Entremont (2001-010-00228)

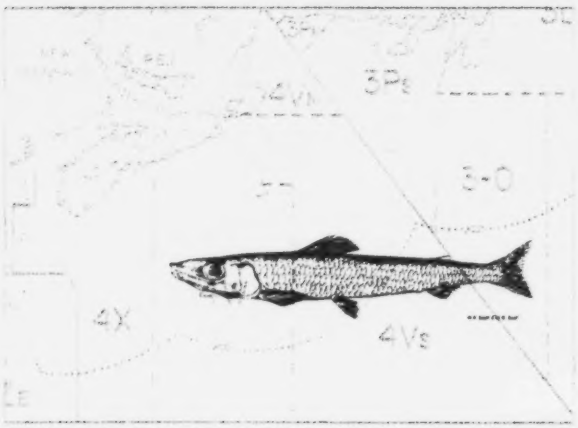
Scotia Fundy Mobile Gear Fishermen's Association – Brian Giroux (2001-010-00232)

Silver Hake Advisory Committee – Evan Walters (2001-010-00227)

Council's Views on Stock Status

Overall Stock Indicator:	low relative to long term mean.
	Compared to average
Spawning Biomass:	likely below average
Total Biomass:	below average
Recruitment:	prospects are improving, with two above average year-classes (98' and 99') entering the fishery, 2000 year class appears weak
Growth and Condition:	long-term declining trends in biological indices with condition, mean length-at-age, and length with 50% maturity all at low levels relative to long-term mean.
Age Structure:	few year classes but typical for this species
Distribution:	resource concentration index highest observed indicating that resource is widely distribution. Questions on identity of Gulf of Maine portion of stock.
Recent Exploitation Level:	appears high

ARGENTINE - 4VWX



The FRCC recommends that the TAC for 4VWX argentine be set at 1,000t in 2002/2003.

The FRCC recommends that if this species is pursued in a commercial fashion in the future, there be a requirement for a scientifically based data collection program to improve knowledge about the resource.

PERSPECTIVE

Catches from this stock, which are taken as by-catch in the silver hake fishery, have not exceeded 360t since 1983. Due to overall reduction in effort and catches in the silver hake fishery catches of argentine remain very low. In November 1993, the Council recommended that, as a precautionary measure, the 1994 TAC for argentine in 4VWX be set at 1,000t. The TAC was set at that level for 1994. In 1994, the Council recommended that the 1995 TAC for 4VWX argentine be set at 1,000t and this recommendation has been repeated since.

The Council further recommended for that if this fishery is pursued in a commercial fashion, there be a requirement for a scientifically based data collection program to improve knowledge about the resource.

No comments were received from industry about this stock during the public consultations in Nova Scotia in November 2001.

ANALYSIS

No assessment of this stock was undertaken in 2001. Scientific information available is from very old Stock Status Reports.

DFO Stock Status Reports indicate that there is too little known about this stock to generate sufficient data for analytical purposes. Given the by-catch nature of this fishery and the very low catches in recent years, the Council has no reason to change its outlook on this stock. The recommended 2002/2003 TAC is set at 1,000t, as a precautionary measure.

Figures are in 000t

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001[1]
TAC	10	10	10	10	10	10	10	10	10	1	1	1	1	1	1	1	1
Catch	0.29	0.2	0.08	0.35	0.11	0.22	0.14	0.03	0.13	0	0.11	0	0	0	0	0.008	0.016

*Canadian Catch as of Dec 12/01

1. Figures are from the Integrated Fisheries Management Plan Atlantic Groundfish

Sources

DFO Science

CAFSAC Report (1992) 4VWX Argentine

FRCC Consultations

Barrington, NS (November 19)
Port Hawkesbury, NS (November 20)
Dartmouth, NS (November 21)

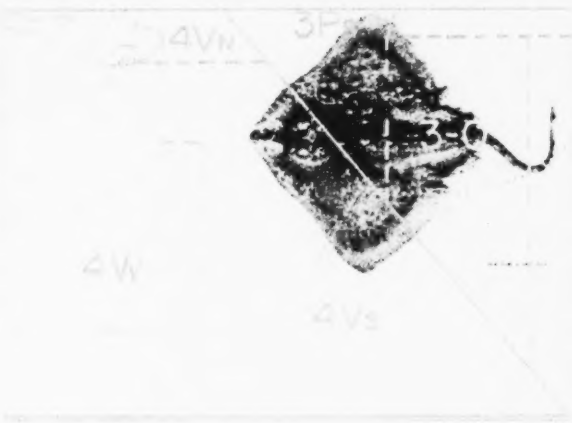
Written Briefs

No briefs received.

Council's Views on Stock Status

Overall Stock Condition:	unknown
	Compared to average
Spawning Biomass:	unknown
Total Biomass:	unknown
Recruitment:	unknown
Growth and Condition:	unknown
Age Structure:	unknown
Distribution:	unknown
Recent Exploitation Level:	assumed low

SKATES - 4VSW



PERSPECTIVE

Winter skate occur in the southern waters of Georges Bank, inner Bay of Fundy and on the offshore banks of the eastern Scotian Shelf. Winter skate are the primary focus of the commercial fishery and constitute greater than 90% of the catch. Thorny skate occur as a by-catch in this fishery and only the largest individuals are retained.

Like other elasmobranchs, skates are slow growing, produce very few young each year and thus are slow to increase in population numbers. Length at 50% maturity for female winter skate occurs around 75cm. Preliminary ageing of winter skate suggests that the length at 50% maturity coincides with individuals, which are 7-8 years old. Historical information shows that skates consume considerable quantities of sand lance. Skate predators have yet to be identified.

Most elasmobranch fisheries have followed a general pattern of high initial exploitation followed by a rapid collapse. The intention has been that the "developing" skate fishery on the eastern Scotian Shelf not follow this course. The knowledge of skate on the Scotian Shelf is limited, however recent research is increasing the information base.

ANALYSIS

The outlook from the 2000 Stock Status Report based on the assessment of the stock included the following.

> "*Long term data from the RV survey suggests that current levels of abundance and productivity are low. Industry data, available only since 1995, suggests that recent abundance has been stable. Skates are elasmobranches with slow growth and fecundity, life history characteristics, which makes them susceptible to overexploitation. Hence fishing mortality should not be allowed to increase and continued monitoring is required.*"

Declines in several indicators from the new information available suggest that there are increased concerns for the status of this resource.

Fishermen who direct for skates say at consultation that increased catch rates and good size ranges do not match the view of the SSR. They feel that this stock could support increases in TAC. Seismic exploration was blamed for fish movement from traditional areas for a period of time. This was a potential reason for the lack of skates in the RV July survey.

The Council is concerned with the disparity between the SSR and fishermen's views of this stock. However, the Council feels that there is no alternative but to err on the side of caution. Due to both the slow growth of elasmobranchs and the summer RV biomass trends of 75cm+ winter skate, caution is required. The Council also feels that due to continuing negative trends in this stock, fishing effort although minimal, must be reduced. However, closure would eliminate an important source of stock status information that could be determined by a small, directed survey, which could assist DFO in monitoring condition and changes in the stock. Therefore Council feels that a minimal TAC is warranted if utilized to support the ongoing continued survey.

The FRCC recommends the TAC for 4VsW skate be set at 200t for 2002/2003 to support a joint industry/DFO survey.

Figures are in 000t

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001*
TAC										2	1.6	1.6	1.2	1.2	0.6	0.6	0.4
Catch					3.8	5	4.3	2.3	2.1	3.1		1.6	1.04	0.525	0.623	0.4	0.44

*Canadian Catch as of Dec 12/01

1. Figures are from the Integrated Fisheries Management Plan Atlantic Groundfish

Sources

DFO Science

SSR A3-29 (2000) 4VsW Winter skate

FRCC Consultations

Barrington, NS (November 19)
Port Hawkesbury, NS (November 20)
Dartmouth, NS (November 21)

Written briefs

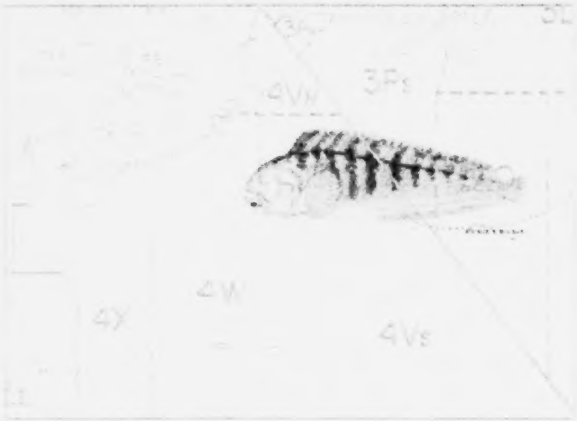
No briefs received.

Council's Views on Stock Status

Overall Stock Indicator:

	Compared to average
Spawning Biomass:	no particular observation
Total Biomass:	below average (thorny skates)
Recruitment:	below average
Growth and Condition:	size declining
Age Structure:	below average
Distribution:	below average
Recent Exploitation Level:	unsustainable

WOLFFISH - 4VWX+5YZc



PERSPECTIVE

Atlantic wolffish are a solitary fish that have a large range and are prevalent in the approaches to the Bay of Fundy, Browns, LaHave and Roseway Banks. They are demersal, usually found between 50 and 150 meters, and have a wide temperature tolerance. Wolffish feed on rocky bottoms on various invertebrate species such as crabs, whelks and sea urchins. Wolffish grow slowly and mature after approximately 10 years. Landings were between 1000 and 1500t in the 1960's and increased to over 4000t in the 1980's, and then dropped steadily in the 1990's. Landings in 1999 were 304t and then dropped to 189t in 2000. Current annual landings are estimated to be approximately 200t. Wolffish are caught by both mobile and fixed gear sectors as a by-catch species.

ANALYSIS

There was very little discussion of this stock during any of the consultation sessions held in November 2001. Limited input from industry for this stock advised status quo (no directed fishery) be continued. There were some indications that fishing in areas where wolffish are known to be abundant was not as common this year so catch rates were lower. A slightly wider geographic distribution and increase in small fish was reported by some participants.

No new information or scientific update was provided by DFO for Atlantic wolffish this year. This stock was fully assessed in 2000 for the first time since 1996. The 2000 Stock Status Report indicates that:

- Large numbers of immature fish have been caught in research vessel surveys in sub-area 4 through the 1990s.
- Mature biomass is presently low in 4VWX and 4T.
- Fishing mortality has been low since the mid 1990s.
- Until recent recruitment matures, and the mature biomass improves, care must be taken not to increase fishing mortality beyond the status quo.

While there are signs of increasing abundance and recruitment on the Scotian Shelf, this species is currently being studied by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) due to recent overall stock declines of other wolffish species. It is unlikely that major trends and indicators identified in the last assessment would have changed dramatically in one year.

The FRCC recommends that there be no directed fishery for Atlantic wolffish in 4VWX in the 2002/2003 fishing year.

The FRCC is concerned that developing markets for wolffish will encourage mobile gear to 'top up' on wolffish after directing for other groundfish on a trip. Although within the target fisheries managers limit catches for this stock, the fact that wolffish are present and numerous in well-known areas means that fishermen might target wolffish as a 'directed by-catch'. This activity clearly violates the spirit of the recommendation that there be no directed fishery on this stock. As long as the fishing effort continues in known fishing areas in 4X where this species is concentrated, it may contribute to overall stock decline.

The FRCC recommends that this be a restrictive by-catch fishery only; measures should be implemented to minimize by-catches of wolffish in all fisheries directed at other species.

Figures are in 000t

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
TAC																	
Catch					0.6	0.6	0.5	0.7	0.6	0.4	0.24	0.6	1.03	0.53	0.53		

1. Figures are from the DFO Stock Status Report on Wolffish SSR A3-31(2000)

Sources

DFO Science

Research Document 2001Summer Groundfish Survey

SSR A3-31 (2000) Wolffish on the Scotian Shelf and Georges Bank and in the Gulf of St. Lawrence (Sub-area 4 and Div. 5YZe)

FRCC Consultations

Barrington, NS (November 19)
Port Hawkesbury, NS (November 20)
Dartmouth, NS (November 21)

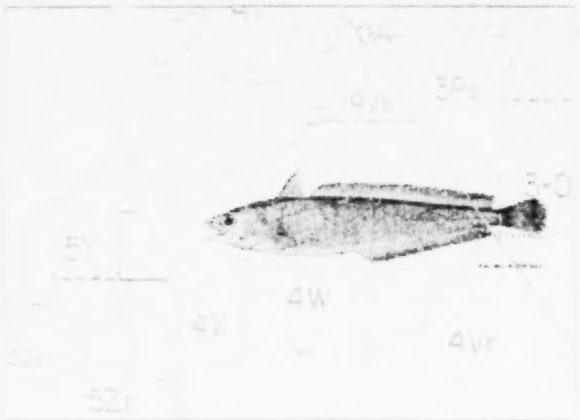
Written Briefs

Inshore Fisheries Limited - Claude d'Entremont (2001-010-00228)

Council's Views on Stock Status

Overall Stock Indicator:	low
	Compared to average
Spawning Biomass:	low, declining in 4VWX
Total Biomass:	low, declining in 4VWX
Recruitment:	near average or increasing, small fish in 4X
Growth and Condition:	below average
Age Structure:	poor
Distribution:	average
Recent Exploitation Level:	has remained low

White Hake - 4VW



Perspective

White hake are bottom dwelling fish that prefer mud bottoms, temperatures between 3 and 10 degrees and depths of 50 to 200m. Depth range varies with life history. Spawning times are not well understood.

Landings have generally been low in this management area ranging from 447t in 1998 to 391t in 2001. White hake is primarily landed by fixed gear sectors as a by-catch of other directed fisheries.

Since 1998, scientific analysis of white hake has been split into two management areas 4VW and 4X5Zc and now also includes 4Vn as a separately assessed stock subcomponent. White hake across the entire Scotian Shelf and Gulf of Maine in 4VWX and 5Zc is managed based on sector and gear suballocations related to each management area. Landings are minimal in 4Vn and slightly higher in 4VW. The majority of hake is landed in 4X and 5.

Analysis

White hake was assessed in 2001. The 2001 Stock Status Report indicates that for 4VW white hake:

- Total landings have declined since 1987, landings in 1998 were the lowest since 1968 but have increased slightly in 2000 and 2001.
- Abundance indicators remain low.
- Relative fishing mortality remains low, but total mortality remains high.
- Production remains poor, environmental conditions (bottom temperatures) remain positive.
- Commercial catch rates declined since 1996 for all major fleets (longliners, gillnetters, trawlers), with 1998 demonstrating the lowest catch rates.
- Research vessel survey abundance estimates from Canadian (summer 4VWX, spring 4VsW, spring Georges Bank) and US (spring and fall offshore) sources are all near record lows.
- The size composition of the summer research vessel survey catches in 4X has been getting smaller since 1995, and mean weights of individual fish in 4VWX surveys have been declining since 1984.
- There are few large fish in the population
- The assessment of this stock is uncertain due to poor stock definition and incomplete sampling by the research vessel survey gear.

Recommendations from industry ranged from status quo to an increased cap limit to a restored commercial TAC of 3,100t as in pre-1998 levels. Fishermen continue to observe high abundance throughout 4VW since 1998 and maintain that the stock is improving. Increased abundance of white hake has been linked to the return of warmer water temperatures after a cold water event affected the Scotian Shelf in 1998.

Industry feels that RV data are a poor indicator of abundance. They also feel that commercial CPUE data do not reflect abundance of the stock. Although fishermen claim they are not directing for white hake, they are landing a majority of white hake in some trips. It was indicated that white hake is at times unavoidable and is interfering with directed fisheries. White hake are reported to be numerous and interspersed with Atlantic halibut and pollock.

The 2001 assessment shows little increase in this stock. Although DFO advises the survey contains uncertainties, it shows clear evidence of low abundance and productivity. However, feedback from fishermen indicate continued improved abundance as evidenced by the significant increases of catch in the sentinel and halibut longline surveys. Faced with a continued strong discrepancy in opinions of stock status and uncertainties, coupled with conflicting evidence on both sides, it is difficult to reconcile the trends in the stock.

The FRCC recommends that there be no directed fishery for white hake in 4VW in 2002/2003.

Figures are in 000t

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001*
TAC												0.5	0.7	0.7	by-catch		
Catch					3.4	3.7	2.9	3.4	3.6	3.1		0.56	0.5	0.4	0.4	0.35	0.23

*Canadian Catch as of Dec 12/01

1. Figures are from the Integrated Fisheries Management Plan Atlantic Groundfish

The Council is very concerned over the increased effort and landings under the by-catch management system in the fixed gear fishery that may jeopardize stock recovery. The Council believes that directing for white hake within this management system violates the spirit of the 'no directed fishery' measures, and may result in removals that are unsustainable. Vigilance is required to ensure that removals are maintained to a minimum required to allow directed fisheries on other species to occur.

However, landings in 4VW have been maintained at a reasonably low level of under 400 tons. In addition, both DFO industry sentinel and halibut surveys continue to show significant increases consistent with widespread industry observations.

The FRCC recommends that catches should not exceed those required for the normal conduct of other fisheries.

The FRCC recognizes that the stock structure of white hake in 4VWX5Zc may be complex. Fishermen have long argued that stock components are in fact entirely separate stocks.

The FRCC recommends that DFO Science, in conjunction with industry continue the morphometrics testing program on white hake to assist in identifying potential stock subcomponents and refined management delineation. Efforts should continue to delineate significant differences that are suspected in the overall management area.

Sources

DFO Science

SSR A3-10 (2001) White Hake in 4VWX and 5

FRCC Consultations

Barrington, NS (November 19)
Port Hawkesbury, NS (November 20)
Dartmouth, NS (November 21)

Written Briefs

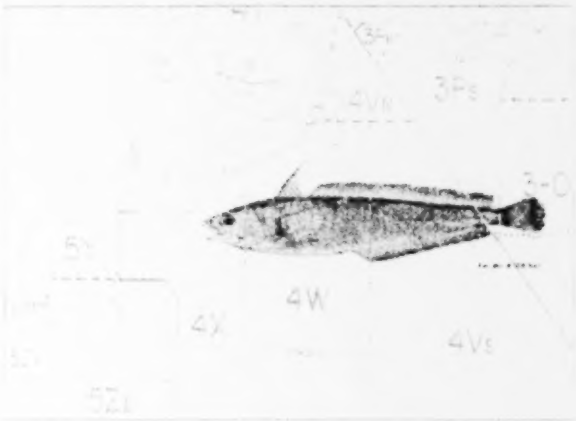
Eastern Nova Scotia 4VsW Management Board – Nellie Baker Stevens (2001-010-00233)

South Shore Gillnet Fishermen's Association – John Levy (2001-010-00229)

Council's Views on Stock Status

Overall Stock Indicator:	very low
	Compared to average
Spawning Biomass:	very low
Total Biomass:	very low
Recruitment:	unknown
Growth and Condition:	declining since 1984
Age Structure:	unknown
Distribution:	stock structure complex, not well understood
Recent Exploitation Level:	very high in mid-1990's, currently low.

White Hake - 4X5Zc



Perspective

White hake are bottom dwelling fish that prefer mud bottoms, temperatures between 3 and 10 degrees and depths of 50 to 200m. Depth range varies with life history. Spawning times are not well understood.

The majority of white hake landings occur in this management area ranging from 2200t in 1998 to 1834t in 2001. White hake is primarily landed by fixed gear sectors as a by-catch of other directed fisheries.

Analysis

The 2001 Stock Status Report indicates that:

- Abundance has increased recently and continues to improve.
- Environmental conditions (bottom temperature) have improved and remain favourable.
- Relative fishing mortality has been low and remains low.
- However, production has declined since the 1980's and remains poor.
- Commercial catch rates declined since 1996 for all major fleets (longliners, gillnetters, trawlers), with 1998 demonstrating the lowest catch rates.
- Research vessel survey abundance estimates from Canadian (summer 4VWX, spring 4VsW, spring Georges Bank) and US (spring and fall offshore) sources are all near record lows.
- The size composition of the summer research vessel survey catches in 4X has been getting smaller since 1995, and mean weights of individual fish in 4VWX surveys have been declining since 1984.
- Mortality rates for 4X white hake derived from summer research vessel survey data depict exploitation at or above 50% throughout the 1990's.
- White hake in 4X + 5Zc are showing signs of recovery through abundance indicators however production indicators remain negative, continued caution is required.
- The assessment of this stock is uncertain due to poor stock definition and incomplete sampling by the research vessel survey gear.

Industry feels that RV data are a poor indicator of abundance. They also feel that commercial CPUE data do not reflect abundance of the stock. Although fishermen claim they are not directing for white hake, they are landing a majority of white hake in some trips. It was indicated that white hake is at times unavoidable and is interfering with directed fisheries. White hake are reported to be numerous and interspersed with Atlantic halibut and pollock. Fishermen reported that white hake were plentiful in 4X5Y, in areas where they were never seen before and especially in deep water, and that as a consequence, by-catches were a problem while directing for other species.

The 2001 assessment shows promising signs of recovery in 4X5Zc and agreement with industry surveys, however negative indicators of production point to a cautious approach. Feedback from fishermen indicate increasing abundance supported by significant increases in the by-catches of white hake in the ITQ and halibut surveys. Due to these uncertainties it is difficult to reconcile trends in stock status between industry and scientific advice.

The FRCC recommends that there be no directed fishery for white hake in 4X5Zc in 2002/2003.

The Council is very concerned over the increased effort and landings under the by-catch management system in the fixed gear fishery that may jeopardize stock recovery. The Council believes that directing for white hake within this management system violates the spirit of the 'no directed fishery' measures, and may result in removals that are unsustainable. Vigilance is required to ensure that removals are maintained to a minimum

Figures are in 000t

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001*
TAC												2.0	2.8	2.8		by-catch	
Catch					3.4	3.7	2.9	3.4	3.6	3.1		2.8	2.6	1.3	1.7	2.27	1.9

*Canadian Catch as of Dec 12/01

1. Figures are from the Integrated Fisheries Management Plan Atlantic Groundfish

required to allow directed fisheries on other species to occur.

The FRCC recommends catches should not exceed those required for the normal conduct of other fisheries.

Sources

DFO Science

SSR A3-10 (2001) White hake in 4VWX and 5

FRCC Consultations

Barrington, NS (November 19)
Port Hawkesbury, NS (November 20)
Dartmouth, NS (November 21)

Written Briefs

Eastern Nova Scotia 4VsW Management Board – Nellie Baker Stevens (2001-010-00233)

Shelburne County Competitive Fishermen's Association – Pam Decker (2001-010-00225)

Inshore Fisheries Limited – Claude d'Entremont (2001-010-00228)

Scotia Fundy Mobile Gear Fishermen's Association – Brian Giroux (2001-010-00232)

Scotia Fundy Inshore Fishermen's Association – Evan Walters (2001-010-00234)

South Shore Gillnet Fishermen's Association – John Levy (2001-010-00229)

Council's Views on Stock Status

Overall Stock Indicator:	low but improving
	Compared to average
Spawning Biomass:	low but improving
Total Biomass:	low but improving
Recruitment:	unknown
Growth and Condition:	declining since 1984
Age Structure:	unknown
Distribution:	stock structure complex, not well understood
Recent Exploitation Level:	very high in mid-1990's

Cusk - 4VWX

Perspective

Cusk is a solitary slow moving species found primarily on the southwestern Scotian shelf. Cusk prefer rocky, gravel and mud bottoms and depths of 75 - 150 meters and warmer waters of 6-10 degrees. Little is known of the biology related to spawning, diet and migration.

Although there has been some directed fishery activity in the past, cusk has historically been caught mainly as a by-catch of other commercial species with little focus and attention on overall stock structure and status. Cusk are primarily caught by long line and are commonly mixed with and caught with white hake and halibut in directed halibut fisheries. Catches have historically averaged 3400t annually. However declining landings and negative indicators resulted in a cap of 1000t being placed on the stock in 1999. Approximately 80% of landings come from area 4X from a maximum of 5,130t in 1973 to a low in 2000. Landings in 4W are smaller and have rarely exceeded 500t. Landings in 4V are minimal.

Despite FRCC recommendations and DFO restrictions to limit excessive by-catches, indications are cusk landings will easily exceed 1000t in the 2001/2002 fishing year.

Analysis

This stock was last fully assessed in 1998. The 1998 Stock Status Report and the Groundfish Updates in 2000 and 2001 indicate that:

- Landings have remained below the long-term mean of 3469t since 1993. Landings in 2000 were over 800t (15 months), but have risen again in 2001 to over 1000t.
- Research vessel survey mean weight per tow declined abruptly in 1992 and has remained below the long-term mean of 1.29 kg since that time, with recent values the lowest in the survey history.
- The cusk stock collapsed abruptly in 1992 and remains very low.
- Research vessel survey catches have shown a restriction of distribution to the western portion of 4X with negligible landings in 4VW.
- This stock continues to show no sign of improvement in 2001. It is likely that the 1,000t cap placed on this stock is not providing adequate restrictions on catches to allow for the stock to rebuild and more restrictive measures may be required.

Public consultations were held in Barrington, Port Hawkesbury and Dartmouth on this stock. Limited stakeholder input agreed with science information that the stock is very low suggesting status quo and continued restrictions on landings. However, despite the drastic decline, cusk are easily caught at traditional levels by certain fishers, and appear to be unavoidable in some longline fisheries, so it was suggested a reasonable by-catch allowance is required. There was also a report of more small fish in 2001. It was stated that severe restrictions if imposed may result in discarding problems as a result of substantial amounts of cusk being mixed with other species.

Cusk have shown a gradual decline in landings, and reduction in geographic distribution from east to west since surveys began in 1970. There was a drastic and abrupt reduction in abundance noted in 1992 that has persisted to the present. There is also a decrease in both fish condition and abundance of larger fish over 50 centimeters. Many of these characteristics and trends are present in other species although not to the extent seen in cusk since 1992.

A more comprehensive assessment of this stock anticipated by the FRCC in 2001 was not conducted and therefore new information on stock status is limited. However, all available information indicates that the FRCC should not change its outlook on this stock. Future catches should be significantly reduced and more restrictive measures should be undertaken to conserve and rebuild the cusk stock. Due to continued negative signs regarding abundance and geographic distribution the current restricted by-catch should be

Figures are in 000t

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001*
TAC												1.5			by-catch		
Catch					2.7	3.1	3.8	4.2	2.4	1.9		1.91	1.7	1.49	1.05	0.83	1.09

*Canadian Catch as of Dec 12/01

1. Figures are from the Integrated Fisheries Management Plan Atlantic Groundfish
2. Catch for 2000 is from DFO Science Stock Status Report A3-35(2001) Upates on Selected Scotian Shelf Groundfish Stocks in 2001

made more restrictive to avoid further deterioration of this stock and to continue to assist in rebuilding efforts.

The FRCC recommends that there be no directed fishery for cusk in 4VWX in 2002/2003.

Due to recommendations for restricted by-catch fisheries and concern for this stock over the past few years landings have been maintained at recent historical levels with no sign of recovery. However, it is evident incidental landings will increase significantly and disproportionately (20%) compared to the associated directed fisheries in 2001. The FRCC is concerned that available markets for cusk may encourage some fishers to 'top up' on cusk after targeting another groundfish on a trip.

While within the target fisheries management limit catches for this stock, the idea that cusk are present in known concentrated favored areas means that fishermen may either target and/or not avoid cusk. This activity clearly violates the spirit of the FRCC recommendation that there be no directed fishery – by-catch fishery or otherwise on this stock. This is cause for concern. If concentrated fishing effort occurs in known fishing areas or refuges in 4X where this species is concentrated, it may harm chances for recovery or contribute to a further decline in stock status.

The FRCC recommends that there be a restrictive by-catch fishery only and measures should be implemented to reduce current by-catches of cusk in all fisheries directed at other species.

The FRCC recommends that DFO fisheries management conduct a review of cusk fishing areas and catches to identify possible concentrations and sensitive areas and ensure that catches are truly incidental in these areas. Evaluation and consideration should be given to implementing closures in these areas if the level of effort is not reduced.

Given the dramatic decline and poor status of this stock and continued fishing effort which has again increased landings in 2001 there would appear to be a need to advise industry of the possible consequences on future fishing opportunities should the species be considered endangered.

The FRCC recommends DFO advise the appropriate fishing sectors of the importance of conservation measures to the future of this species.

Sources

DFO Science

SSR A3-14 (1998) Cusk on the Scotian Shelf
SSR A3-35 (2000) Updates on selected Scotian Shelf groundfish stocks in 2000
SSR A3-35 (2001) Updates on selected Scotian Shelf groundfish stocks in 2001
Research document - 2001 Summer Groundfish Survey

FRCC Consultations

Barrington, NS. (November 19)
Port Hawkesbury, NS (November 20)
Dartmouth, NS (November 21)

Written Briefs

Eastern Nova Scotia 4VsW Management Board – Nellie Baker Stevens (2001-010-0233)
Shelburne County Competitive Fishermen's Association – Pam Decker (2001-010-00225)
Scotia Fundy Mobile Gear Fishermen's Association – Brian Giroux (2001-010-00232)

Council's Views on Stock Status

Overall Stock Indicator:	low
	Compared to average
Spawning Biomass:	low
Total Biomass:	historical low
Recruitment:	no sign
Growth and Condition:	poor
Age Structure:	below average
Distribution:	no significant change(contracted)
Recent Exploitation Level:	increasing

MONKFISH - 4VWX

PERSPECTIVE

Monkfish also called goosefish or angler, ranges from the Grand Banks and Northern Gulf of St. Lawrence south to Cape Hatteras, North Carolina. Individuals have been collected from inshore areas to depths greater than 800 m, although highest concentrations occur between 70-100m and in deeper waters of about 190m. They have been taken at temperatures from 0-24 deg. C., but in Canadian waters, appear most abundant between 3-9 deg. C.

The stock structure of monkfish is unknown. The degree of mixing in both USA and Canadian waters is unknown and large scale migrations have not been reported. Spawning appears to take place in Canadian waters during the summer months, thus suggesting some degree of independence between the various components.

Monkfish is described as mostly mouth with a tail attached, and reports of monkfish eating prey as big as themselves are common. Growth appears to be fairly rapid and similar for both sexes up to ages 4, (47-48 cm). After this, females grow a bit more rapidly and seem to live somewhat longer, up to 12 years, reaching a size of over 100cm while the males have not been found older than age 9, at approximately 90 cm.

Sexual maturity occurs between ages 3 and 4 and spawning may take place from spring through to autumn depending on latitude.

Monkfish have always been caught as a by-catch of the commercial scallop fishery as well as commercial groundfish fisheries. Markets were developed in the 1970's and 1980's and since then, monkfish have been retained and sold rather than being discarded as undesirable by-catch. Total landings from the two NAFO areas, 4VW and 4X, through the 1970's averaged 6570t. With the inclusion of 5Zc in the 1980's, landings averaged 1637t. The 1990-96 average landings were 1590t and recently down in 2000 with the completion and end of the joint Industry/DFO survey.

ANALYSIS

The DFO 2001 groundfish update reiterates the DFO 2000 assessment indicating that the monkfish population appears to have gone through a period of low productivity and abundance in the late 1980's to the early 1990's and the factors causing this may still be affecting the present population. There are, however, signs of improved recruitment that is beginning to have a positive influence on the adult stock size. A continuation of the recent cautious approach to harvesting is appropriate until productivity trends and the effects of harvesting can be more accurately defined.

Available indicators for monkfish in 4VW show very similar trends to those of 4X, although fishery removals are much higher in 4X. This suggests that a cautious approach to exploitation should continue in the 4VW area. It also suggests that many of the changes observed in both areas may be driven by changes in environmental conditions.

The indicator trends for 5Zc portion of the stock are cause for concern.

The FRCC recommends that there be no directed fishery for monkfish in 4VWX+5Zc in 2002/2003.

The FRCC recommends that there be a restrictive by-catch fishery only, measures should be implemented to minimize by-catches of monkfish on all fisheries directed at other species.

Consultations on monkfish 4VWX were held in Barrington, N.S, Port Hawkesbury, N.S, and Dartmouth, N.S. on November 19, 20, and 21, 2001, respectively. At consultations, fishermen's representatives stated that they were concerned with the 5Zc indicator trends and that they could easily address the problem through fleet conservation harvest plans. Also, a large portion of the 4X monkfish landings in 2000 came from by-catches in the redfish fishery along the continental shelf. To date, this redfish fishery had not taken place in 2001, therefore monkfish catches from that area were low this year. The general comments from industry were that the monkfish resource appears healthy and to maintain status quo for 2002-2003.

Figures are in 000t

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001*
TAC												0.7	0.2		by-catch		
Catch					0.6	0.8	0.8	0.8	0.6	1.2		0.71	1.4	0.82	1.30	0.90	1.06

*Canadian Catch as of Dec 12/01

1. Figures are from the Integrated Fisheries Management Plan Atlantic Groundfish
2. Catches for 2000 and 2001 are from DFO Science Stock Status Report A3-35(2001) Updates on Selected Scotian Shelf Groundfish Stocks in 2001

The FRCC continues to be concerned about the incidences of monkfish by-catch in the inshore scallop fishery in the Bay of Fundy, especially given recent indications that incoming scallop recruitment is strong. This may support increased fishing effort by the scallop fleet and possible increases in monkfish by-catch.

The FRCC recommends that levels of monkfish by-catch and removals by the scallop fleets be quantified, documented and used in future assessments.

In response to the FRCC recommendation last year regarding measures to evaluate localized concentrations, DFO noted that current exploitation in these areas may not be sustainable. Given this response, it is implicit that lower levels of exploitation need be enforced. It is therefore critical to learn more about what exploitation limits are estimated sustainable on localized populations of monkfish in order to manage these areas more effectively.

The FRCC recommends that DFO Fisheries Management, in consultation with industry, develop harvest plans in other fisheries to avoid excessive by-catch of monkfish in localized areas.

Sources

DFO Science

SSR A3-35 (2001) Updates on Selected Scotian Shelf Groundfish Stocks in 2001

FRCC Consultations

Barrington, NS (November 19)
Port Hawkesbury, NS (November 20)
Dartmouth, NS (November 21)

Written briefs

Inshore Fisheries Limited – Claude d'Entremont (2001-010-00228)

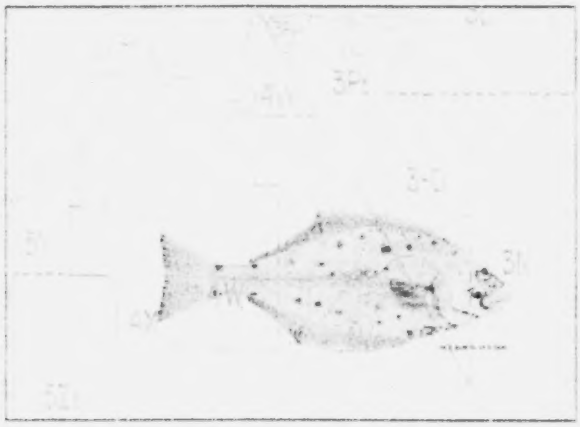
Scotia Fundy Mobile Gear Fishermen's Association – Brian Giroux (2001-010-00232)

Scotia Fundy Inshore Fishermen's Association – Evan Walters (2001-010-00234)

Council's Views on Stock Status

Overall Stock Indicator:	average
	Compared to average
Spawning Biomass:	below average, large fish declining
Total Biomass:	below average
Recruitment:	strong / Increasing
Growth and Condition:	stable
Age Structure:	no particular observation
Distribution:	average
Recent Exploitation Level:	above average

Atlantic Halibut - 3NOPs4VWX5Zc



Perspective

Atlantic halibut is the largest of the flatfishes in Atlantic Canada ranging from Greenland to the Grand Banks to Georges Bank, and in the Gulf of St. Lawrence. In more recent times, the range of Atlantic halibut seems to have been reduced in the northern portion, along the Labrador Shelf. Atlantic halibut are most abundant in the deep-water channels running between the banks and on the edge of the continental shelf.

Females grow faster than males, and reach a much larger maximum size. Females appear to achieve 50% maturity at 115 cm, while males appear to attain 50% maturity at 75 cm. Adult Atlantic halibut have a low catchability (e.g. are not caught well) by the DFO research vessel survey. A joint industry/DFO longline survey has been conducted since 1998, following FRCC recommendations for such a survey beginning in 1995.

Analysis

The 2001 stock assessment, the first since 1997, indicates that:

- TAC increases of 150t occurred in 2000 and again in 2001 resulting in a 2001 TAC of 1150t
- White hake, cusk, cod, and a range of other species are caught together with halibut
- Recent indications of increased abundance of pre-recruits (halibut<82cm)
- Adult halibut have low catchability in the RV trawl resulting in high variability of adult abundance estimates
- The industry longline survey provides the capacity to monitor the halibut population
- The commercial longline survey index and the fixed station index show little change in population size
- Halibut population appears to be relatively stable; however, cannot determine if current landings are sustainable

Industry observations were common that Atlantic halibut abundance was widespread with a mixture of sizes, throughout its range. The results from FRCC questionnaires distributed to fishermen in eastern and western Nova Scotia in 2001 continue to reflect their view that the status of the stock, the availability of halibut, and the condition of halibut are improved and unchanged in recent years.

The TAC increases from 850t to 1000t in 2000 and from 1000t to 1150t in 2001 were expressed by industry to be steps in the right direction. However, a recurring industry view is that the TAC could easily be set at 1500t now without placing the stock in any danger. In this regard, industry members feel strongly that the work and results of the halibut longline survey were not reflected in the 2001 stock assessment and stock outlook. Industry also expressed disappointment that the "full assessment" with abundance estimates was not produced for Atlantic halibut as DFO had undertaken to provide in 2001.

The Council commends the cooperative efforts of the industry and DFO Science in the continuation of the halibut longline survey that commenced in 1998. This survey, for which 1999 was the first year of full coverage, provides the best opportunity to measure the status of this resource on a continuing basis. At the same time, the FRCC is concerned that the "gap" between the view of stock status by DFO Science and industry may erode the willingness of the industry to maintain and continue the survey. The FRCC supports all measures to ensure the continuing integrity of the survey for the long-term, e.g., the need to extend coverage fully on the Grand Banks in SA3.

The FRCC recommends that the industry/DFO halibut longline survey be continued with sufficient observer coverage to ensure its ongoing integrity especially in NAFO SA3.

In 2000, the FRCC recommended that DFO incorporate into the industry/DFO longline survey an evaluation of the Atlantic halibut tagging and mark-recapture

Figures are in 000t

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001*
TAC				3.2	3.2	3.2	3.2	3.2	3.2	1.5	0.85	0.85	0.85	0.85	0.85	1	1.15
Catch	4	3.3	2.6	2.3	1.9	2.1	2.2	1.30	1.2	1.04	0.72	0.79	1.16	0.96	1.3	0.98	0.23

*Canadian Catch as of Dec 12/01

1. Figures are from the Integrated Fisheries Management Plan Atlantic Groundfish

information to generate estimates of stock biomass. Subsequently, DFO reported that the extensive halibut tagging data collected over time are not suitable to be used in estimating biomass. Undoubtedly, DFO Science recognizes that the tagging information can be used in many different models to provide insight into stock structure (currently poorly defined), stock movements (unknown to date), and abundance trends (not estimated to date). The following recommendation recognizes and encourages the use of all sources of data on this stock.

The FRCC recommends that DFO Science report by the end of 2002 on the industry tagging data description (years, numbers of observations including fish tagged over time, returns, etc.) and recommend proposals for use of this data in halibut stock population monitoring.

It was reported by DFO that the funding for the age validation study has been secured and work is anticipated to begin. The FRCC applauds this development and regrets only that this was not available in time to carry out a full assessment in 2001.

The FRCC reiterates and emphasizes its previous recommendation that aging of Atlantic halibut samples be given high priority.

In light of the recognized problems related to the DFO RV survey for halibut, and considering the observations of industry based on their experience in the commercial fishery, the Council decided to recommend a directional increase in the TAC from 850t to 1,000t for 2000/2001 and from 1000t to 1,150t for 2001/2002. The Council recognizes and continues to share the frustration of fishermen in wanting TAC decisions to be based on the real status of this resource. The Council had also anticipated that a full assessment in 2001 would for the first time use the longline survey results along with proper aging and mortality information to generate absolute biomass estimates and harvest rates associated with the fishery. The Council shares with industry its disappointment that a "full assessment" with abundance estimates was not produced for Atlantic halibut despite previous written assurances from the

Sources

DFO Science

SSR A3-23 (2001) Atlantic Halibut on the Scotian Shelf and Southern Grand Bank (Div. 4VWX3NOPs).

FRCC Consultations

Barrington, NS (November 19)
Port Hawkesbury, NS (November 20)
Dartmouth, NS (November 21)

Written Briefs

Shelburne County Competitive Fishermen's Association – Pam Decker (2001-010-00225)

Inshore Fisheries Limited – Claude d'Entremont (2001-010-00228)

Scotia Fundy Inshore Fishermen's Association – Evan Walters (2001-010-00234)

Eastern Nova Scotia 4VsW Management Board – Nellie Baker Stevens (2001-010-00233)

Council's Views on Stock Status

Overall Stock Indicator:	improving in recent years
	Compared to average
Spawning Biomass:	unknown
Total Biomass:	stable or possibly increasing
Recruitment:	indications of incoming recruitment
Growth and Condition:	no reliable information
Age Structure:	unknown
Distribution:	appears to be widely distributed
Recent exploitation Level:	unknown

Department that such an assessment would be undertaken. The Council acknowledges the view that the halibut stock status presented in the Traffic Light Method, used for the first time in this assessment, shows continued improvement in stock status. A visual review of the Traffic Light table for this stock shows that the halibut survey indicators all show continued improvement (from red-yellow to green-yellow) over the four year period of the survey. As well, the RV survey indicators also show improvement (from red dominated to yellow dominated) over the last three year period. The aggregated "characteristics" of abundance and production likewise show that these stock summary indicators have improved since 1995.

While the most recent scientific information appears positive, this follows several years of relatively poor index results. There is a need to confirm whether the recent good performance of the index will continue. The Council believes that continued year-over-year increases in the TAC may not enable a reasonably clear determination of impact on stock rebuilding. Accordingly, the Council is of the view at this point that it is precautionary to maintain the status quo for the coming year and reassess stock indicators in the future with the intent of determining whether a more significant increase is sustainable and consistent with continued rebuilding. The Council notes that this is a slow growing, long-lived species, and that deferring increases in the halibut TAC now is an investment in improved yield in the future.

The FRCC recommends that the Atlantic halibut TAC be set at 1,150t for 2002/2003.

Chapter 3: Redfish Stocks
Stock-by-Stock Recommendations

Redfish Unit 1 - 4RST+3Pn (Jan-May)+4Vn (Jan-May)

Perspective

Redfish is a long lived species with a low fecundity rate. The spawning stock biomass is supported by few strong year classes, usually appearing every 10 years. In the past decade, recruitment has remained low.

The Unit 1 Redfish stock was implemented in 1993 and was previously managed as Divisions 4RST. It supported a large fishery in which landings averaged 82,000t during the years 1970-1976. Another peak of biomass, leading to high catches, was observed at the beginning of the 90s. The biomass decreased afterward steadily. A moratorium was implemented in 1995 and continues since.

For 1997, the FRCC recommended that cooperative industry science surveys take place. For 1998, the FRCC further recommended that a joint industry science sentinel survey be established, on an ongoing basis, to include both a fully scientific component and a component to re-establish the commercial catch rate index. It was recommended that catches for this program not exceed 1,000t. Continuation of this program was recommended for 1999 and 2000, with the level of available quota being increased to 2,000t in order to improve the validity of the CPUE index. For 2000, the Council requested that DFO Science identify what changes might be needed with respect to boundaries of the Units 1 and 2 stock management areas. The same recommendations were carried on for the 2001/202 fishery.

A conference call was held November 28, with industry representatives and DFO Science. Industry still holds the view that the stock remains in a relatively poor condition even if good concentrations of fish were observed in the eastern part of the Laurentian Channel and in southern 4R. Industry raised concerns that some FRCC recommendations, such as migration study and effort distribution monitoring were not followed. The Gulf of St. Lawrence-based group expressed again considerable concern regarding the questions about stock affinities between Units 1 and 2. That group recommended that this issue must be solved as soon as possible as it feels strongly that Units 1 and 2 are a single stock unit and that closing Unit 2 would help the recovery in Unit 1. In its view, the two Units lead to management inconsistencies between the two areas. Another group challenged this opinion based on the year-class strength and effort distribution. There was support for the continuance of the index and sentinel fisheries, as the information obtained increased resolution of the stock's status. Industry representatives considered that 2000t should be kept.

Analysis

In 2001, DFO Science provided only an update of the previous stock status report. This update is based on the science research vessel survey, the GEAC grid survey, the indexed fishing trips and the sentinel surveys. No new information is provided on the mixing issue between Units 1 and 2. Following FRCC's recommendation, DFO Science analyzed the database to verify the occurrence of small redfish in the shrimp fishery. This analysis concluded that the amount of by-catch was much lower than before the introduction of the Nordmore grid.

The 2001 DFO update on the Stock Status Report indicates:

- The biomass remains stable at low levels since 1995; the biomass index provided by the GEAC survey increased in 2001 and was close to the 1999 value.
- Recruitment remains dismal. The two year classes observed in 2000 (1996 & 1998) are still present and the year class 1999 is also observed. Those classes are much less abundant than the 1988 year class. Year class 1996 has decreased significantly in recent years. Year classes 1996 and 1998 are now considered as to be a mix of two species, *Sebastes fasciatus* and *S. mentella*.

Figures are in 000t

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001*
TAC	50.6	55.6	55.6	56.6	57	57	57	67	60	30				Moratorium			
Catch	35.1	36.4	43.4	51.9	55.2	63.8	68	77.4	51.8	19.8	0.02	0.02	0.02	0.30	1.05	1.14	1

*Canadian Catch as of Dec 12/01

1. Figures are from the Integrated Fisheries Management Plan Atlantic Groundfish

- Like in previous years, distribution remains restricted, with concentrations being found mainly in the Laurentian Channel south and east of Anticosti Island.

Once again, the Council remains concerned about the status of this stock, for which any substantial recovery has yet to occur. While both the 1996 and 1998 year classes may be stronger than other recent year classes, neither appears to be strong enough to contribute significantly to the fishery. The rapid decline of the 1996 year class increases the concerns regarding this stock unit.

The FRCC recommends that there be no directed commercial fishery for Unit 1 Redfish in 2002/2003.

One again, the FRCC recognizes that the re-establishment of the commercial fishery index and the industry/science survey, in 1998, have helped to put redfish fishers in direct contact with the resource and has generated important information about the stock. The Council continue to believe that these activities should continue in order to generate information that may be used to supplement that which is obtained through DFO's annual research survey. The Council therefore, along with the Industry, feels that the current level of index efforts should continue for at least the 2002/2003 season.

The FRCC recommends the established joint industry/science survey and the index fishing program continue in the 2002/2003 season. The level of harvest allowed for these efforts in 2002/2003 should not be allowed to exceed 2,000t.

Considering the results of the Redfish Multidisciplinary Research Program and the strong views of the Gulf of St. Lawrence fishing industry that the Units 1 and 2 should be considered as a single entity, the FRCC feels that the clarification of stock delineation is crucial. The FRCC notes with dissatisfaction that the follow-up investigations to the Redfish Multidisciplinary Research Program did not proceed in 2001 as was recommended in our previous report. These further investigations are necessary in order to have a firm foundation of information by which the redfish stocks, particularly in Units 1 and 2, may be managed.

Sources

DFO Science

SSR 01-A1 (2000) Status of Redfish Stocks in the Northwest Atlantic: Redfish in Units 1, 2, and in Division 3O

SSR 01-A1 (2001) Update on the Status of Redfish Stocks in the Northwest Atlantic: Redfish in Units 1, 2, and in Division 3O

FRCC Consultations

Conference Call (November 28)

Written Briefs

No briefs received.

Council's Views on Stock Status

Overall Stock Condition:	stable at a low level
	Compared to average
Spawning Biomass:	stable at a low level
Total Biomass:	stable at a low level
Recruitment:	no significant recruitment since 1980 yearclass
Growth and Condition:	average, similar to other redfish stocks
Age Structure:	poor
Distribution:	relatively restricted
Recent Exploitation Level:	low, approximately 2% of survey biomass
Natural Mortality:	may be higher than previously accounted for.

The FRCC recommends that stock definition should be a high priority issue for DFO Science.

- **DFO should put together available information dealing with the Units 1 and 2 mixing issue;**
- **DFO should bring together scientists, industry and managers to analyze this information; and,**
- **DFO Science, Fisheries Management and Industry should identify and priorize work that needs to be undertaken as follow-up to the results of the analysis. This initiative should be undertaken, and sufficient human and financial resources should be brought to bear, with the objective of incorporating results into the future management of the various stocks as soon as possible.**

While redfish by-catch in shrimp fishery has decreased since the implementation of the Nordmore grid, that by-catch remains a source of concerns. Even if the number is low in absolute terms, it may be significant with respect to the current status of the biomass and may be an impediment to stock recovery.

The FRCC recommends that the monitoring of redfish by-catch in shrimp fishery be continued and reported. A special attention should be paid to the winter shrimp fishery in the area of the Cabot Strait, when redfish congregate.

REDFISH UNIT 2 - 3PS4VS4WFG+3PN4VN (JUN-DEC)

PERSPECTIVE

Redfish is a long lived species with a relatively low fecundity rate. The mature stock biomass is supported by few strong year classes, usually appearing every ten years. The Unit 2 management area for this stock was implemented in 1993 and was previously managed as 3P redfish. The stock continues to support a fishery however, catches have been reduced in recent years due to overall stock decline.

In November 1993, the Council recommended that the TAC for Unit 2 redfish be reduced from 28,000t to 25,000t for 1994. Since then the Council has been advising for lower TAC's in order to conserve the stock and provide the opportunity for rebuilding. The Council has also introduced small fish protocols and no fishing in 3Pn and 4Vn during an extended period of the year.

The FRCC's Atlantic-wide conference by telephone on redfish stocks was held on November 28, 2001. Public consultations were held in Placentia, Marystown, and Harbour Breton and written comments were also received.

In recent years industry representatives observed that the size of redfish in the catch in Unit 2 was not as uniform as was being implied in the SSR, noting the size in the commercial catch ranged from 28-38 cm. Skepticism was also expressed that there was such a clear demarcation between 1980 and 1988 year classes being exclusively *S. mentella* and *S. fasciatus* respectively. Industry stated that it had adopted the recent recommendations of the FRCC and re-directed its effort to harvest proportionally more of the 1988 year class in 2001. The SSR indicates that overall the catch to September represented about 38% of the catch were of year classes other than the 1980 year class. In 2000 industry representatives proposed a two-year approach to setting the TAC, i.e. reducing the TAC in 2001 to 9,000t and in 2002 to 8,000t. This proposal was in part to enable industry to begin to make operational adjustments. Gulf-based harvesters expressed considerable concern regarding the questions about stock affinities between Units 1 and 2 and recommended that a precautionary approach be followed while and until further information was collected.

ANALYSIS

The FRCC notes with dissatisfaction that the follow-up investigations to the Redfish Multidisciplinary Research Program did not proceed in 2001 as was recommended in the previous report. These further investigations are necessary in order to have a firm foundation of information by which the redfish stocks, particularly in Units 1 and 2, may be managed.

The FRCC recommends that stock definition should be a high priority issue for DFO science.

- **DFO should put together available information dealing with the Units 1 and 2 mixing issue;**
- **DFO should bring together scientists, industry and managers to analyze this information; and**
- **DFO Science, Fisheries Management and Industry should identify and priorize work that needs to be undertaken as follow-up to the results of the analysis. This initiative should be undertaken, and sufficient human and financial resources should be brought to bear, with the objective of incorporating results into future management of the various stocks as soon as possible.**

The most recent GEAC industry survey indicates a biomass index level at 141,000t, 16% lower than 2000 but the industry survey abundance at 404 million increased by 27%. This estimate reflects the number of small fish has increased and the number of larger fish have decreased between 2000 and 2001. The surveys consistently indicate the presence of both the 1980 and 1988 year classes. Interestingly these year classes (1980 and 1988 year classes) are not present in the Gulf surveys since the collapse of the Unit 1 stock.

Figures are in 000t

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001*
TAC	18	18	18	15	15	10	15	25	28	25	14	10	10	11	12	10	8
Catch	11.5	9.7	14	10.7	15.3	15.8	23.8	24.6	27	24.1	12.4	9.3	9.6	10.9	17.2	7.7	4.57

*Canadian Catch as of Dec 12/01

1. Figures are from the Integrated Fisheries Management Plan Atlantic Groundfish

The DFO Stock Status Report for 2000 was developed on the basis of stock unit boundaries as they currently exist; it indicates that:

- DFO surveys of 1994-1997 and 2000 suggest stability. GEAC surveys indicate some decline in the biomass since 1998.
- The 1980 year class accounted for 30% of the DFO survey abundance and 60% of the biomass. The 1988 year class accounted for 22% of the DFO survey abundance and 19% of the biomass. The 1994 and 1998 year classes (<22 cm) together represented about 35% of the DFO survey abundance and 5% of the biomass.
- The 1988 year class is increasing its contribution to the adult population but may be less abundant than the 1980 year class that has been sustaining the fishery for much of the past ten years. The 1988 year class is making a significant contribution to the fishery recently.
- The total available adult population is expected to decline in the next 1 to 2 years as a result of the 1980 year class being harvested. Thereafter, prospects for both the stock and the fishery will depend heavily on the degree to which the 1988 and 1994 year classes contribute to reproductive potential and yield.

With a history of intermittent recruitment pulses in this slow growing species, it is to be expected that the adult biomass will fluctuate up and down in periodic cycles. The primary conservation question in relation to this stock is how fast the available yield of the 1980 year class should be drawn upon in the short term, pending confirmation of the strength of more recent year classes recruiting to the fishery. A two year planning horizon was proposed in 2000, in that the next comprehensive view of this stock will not be available until after the results of the 2002 DFO research survey are

Sources

DFO Science

SSR A1-01 (2000) Status of Redfish Stocks in the Northwest Atlantic: Redfish in Units 1, 2, and in Division 3O

SSR A1-01 (2001) Update on the Status of Redfish Stocks in the Northwest Atlantic: Redfish in Units 1, 2, and in Division 3O

FRCC Consultations

Placentia, NF (November 19)
Marystown, NF (November 20)
Harbour Breton, NF (November 21)
Conference Call (November 28)

Written Briefs

GEAC – Bruce Chapman (2001-010-00250)

Council's Views on Stock Status

Overall Stock Condition:	stable
	Compared to average
Spawning Biomass:	stable
Total Biomass:	stable
Recruitment:	increasingly uncertain over actual strength of 1988 and 1994 year classes
Growth and Condition:	average; similar to other redfish stocks
Age Structure:	moderate with respect to the total biomass; concern about the confirmed presence of only one significant year class of *S. mentella*
Distribution:	good; similar to previous years
Recent Exploitation Level:	low

available. At that time, the relative strength of both the 1988 and 1994 year classes will be better known. At that time, there should also be an early indication of whether a significant year class of *S. mentella* will have resulted from the warm temperature spike experienced in 2000.

The RV survey in 2000 indicates a stable survey biomass of approximately 250,000t. Acoustic data indicates the mean availability to the research trawl was about 80%. At this level, the 2000/2001 TAC of 10,000t represents a fairly conservative harvest rate of less than 4 % ($F_{0.1}$ approximates an exploitation rate of 12%). However, there is concern that year classes since 1980 have consisted primarily of *S.fasciatus*, which appear to have experienced some decline in strength despite very low exploitation. For greater clarification on this point, the abundance of the 1988 year class declined by about 20% between 1994-95 and 1996-97, though the 2000 abundance appears to be similar to that of 1996-97. This observation raises some uncertainty in relation to the ability of these 'post-1980' year classes to contribute to future fisheries. It may therefore be appropriate to discount some of the future contribution associated with the 40% of the biomass that relates to the post 1980 year classes. However, even by discounting the entire biomass associated with fish younger than the 1980 year class, the corresponding harvest rate associated with harvesting only the 1980 year class at the level of about 10,000t would be less than 6%. In considering these factors, the Council is also concerned that the stock has only one significant year class of *S.mentella* (i.e. the 1980 year class) that has supported this fishery for most of the past 12 years. In light of the fact that the fishery focused primarily on this 1980 year class, and that it will take at least 8-10 years before any new year class of *S. mentella* can enter the fishery, the Council believes caution should be exercised.

The selection of a specific redfish TAC in a given year is somewhat arbitrary. In the absence of a longer-term strategy, the selection of a specific TAC can only be reasonably justified as a 'directional' signal. A key aspect of a longer-term strategy is the extent to which industry and resource managers might agree to 'draw down' from the fishable biomass that would be projected to be available over the years between recruitment pulses. Pursuant to the need to develop a longer-term conservation strategy for this stock, the FRCC plans to initiate discussions with industry and DFO upon receipt of the next DFO assessment following the 2002 research survey.

Acknowledging that the next comprehensive scientific review of this stock will not be available until 2002, the Council concludes there is a need for caution as well a need for reasonable stability in harvest levels in this interim period. Being cognizant of the conservative harvest rate and the re-direction of fishing effort in 2001 by the industry as recommended the FRCC proposes to continue to adopt the interim strategy outlined in the 2001 2-year planning framework.

The FRCC recommends that the 2002/2003 TAC be set at 8,000t. The commercial catch should continue to be monitored as to the proportion of the 1988 year class in the harvest. Overall the relative proportion of the 1980 year class harvested by the industry should not exceed the level achieved in the 2001 fishery.

The Council observes that future conservation measures for this stock are likely to include additional area closures or CHP requirements of the respective fleets.

The FRCC recommends that DFO continue to monitor the size frequency of the redfish catch of each fleet sector, through the at-sea observer, port sampling and dockside monitoring programs. The information should also incorporate both catch and research vessel information (both DFO and GEAC) on size frequencies and species identification by water depth within each statistical subarea.

Ensuring the future viability of the *S.mentella* biomass is an important objective of the Council. While future recruitment cannot be managed, it is believed that all reasonable efforts should be made to facilitate the opportunity for recruitment to occur. Available information suggests that *S. mentella* extrudes its young over the April through June period. Stakeholders are of the opinion that a review of the winter closure period is required in order to ensure fishing does not occur during the peak time that the fish are bearing young.

The FRCC recommends that the April/June closure be continued and DFO Science review the timing period that peak extrusion (young bearing activity) occurs.

The FRCC recommends that the 3PN and 4Vn closure to directed redfish fishing during the months of October through June be continued.

REDFISH UNIT 3 - 4WDEHKLX

PERSPECTIVE

Redfish, also known as ocean perch, occur on both sides of the Atlantic Ocean. They are normally found along the slopes of fishing banks and deep channels usually at 100-700 m in water of 3-8 deg. C. The predominant species on the Scotian Shelf are *Sebastes fasciatus* (Acadian redfish), occuring in the deep basins and at the edge of the continental shelf, and *Sebates mentella* (beaked redfish) occuring in the deeper waters off the continental shelf. Recent genetic research results confirm that Unit 3 redfish are almost exclusively *S.fasciatus* and belong to a separate stock from *S. fasciatus* from Units 1 and 2. There is also a genetic separation between Scotian Shelf redfish and Gulf of Maine populations. While this genetic information provides important insights on stock structure, additional research is required, before its full implications are understood.

The Unit 3 management area (4Wdehkl X) for redfish was first implemented in the 1993 Groundfish Management Plan with a quota of 10,000t.

The TAC has been set at 10,000t for 1997 and 1998, down to 9,400t in 1999, to 9000t in the last two years. Some sectors do not catch their assigned quotas, usually resulting in total catches between 5000-6000t caught annually since 1980.

Consultations on Unit 3 redfish were held in Barrington on November 19, 2001 as well as in Dartmouth on November 21, 2001. At these consultations, the general perception of the stakeholders was that the stock was healthy, however, by-catch problems with other groundfish species and they felt that a high percentage of small redfish were being caught, raised an alarm. The stakeholders advised the Council that they were planning to meet with DFO Fisheries Management and between the two groups felt that they could address the problem before it got out of hand.

ANALYSIS

A Redfish Multidisciplinary Research Program has been conducted over recent years. This program has included a study of stock affiliations between and within current redfish management units. Unfortunately, follow up investigations which were to proceed in 2000 did not materialize. The Stock Status Report for 1999 was developed on the basis of stock unit boundaries as they currently exist. There was no formal assessment conducted on Unit 3 redfish for the last two years. The 1999 DFO Stock Status Report and the 2000 and 2001 DFO Groundfish Updates indicate that:

- Research vessel surveys indicate stability in the population biomass within the management unit and improved recruitment particularly in and around Roseway Basin and Western Ridge. This recruitment, although promising, has not resulted in a detectable increase in the population biomass, but combined with the low exploitation rates which currently prevail, should result in fishing and stock conditions in 2000/1 being much the same as in recent years.
- There is no biological or fishery basis to suggest a need for change in the management of the resource at this time.

The new information presented in the 2001 update on Unit 3 redfish provides no basis for changing that advice. However, evidence that the period of improved recruitment may be over, would have consequences for yield in the medium term.

The Council recognizes and commends industry and DFO for establishing the closed area, which is still in place, to protect juvenile redfish (the 'Bowtie').

The FRCC recommends that the TAC for Unit 3 Redfish be set at 9,000t for 2002/2003.

The FRCC also recommends that the DFO Fisheries Management review, in consultation with industry, the two potential problems in this fishery as indicated by fishermen; (1) the level of by-catch of other groundfish species while directing for redfish, and (2) the fishermen's view that a larger proportion of small redfish were being caught in that fishery.

Figures are in 000t

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001*
TAC									10	10	10	10	10	10	10	9	9
Catch	8	6.7	6.2	3.9	3.3	2.4	1.9	2.5	4.8	5.1	4.8	4.7	6.2	5.80	5.20	5.1	3.49

*Canadian Catch as of Dec 12/01

1. Figures are from the Integrated Fisheries Management Plan Atlantic Groundfish

Sources

DFO Science

SSR A1-01 (1999) Status of Redfish Stocks in the Northwest Atlantic: Redfish in Units 1, 2, and 3, and in Division 3O

SSR A3-35 (2000) Updates on Selected Scotian Shelf Groundfish Stocks in 2000

SSR A3-35 (2001) Updates on Selected Scotian Shelf Groundfish Stocks in 2001

FRCC Consultations

Barrington, NS (November 19)
Dartmouth, NS (November 21)

Written Briefs

Inshore Fisheries Limited – Claude d'Entremont (2001-010-00228)

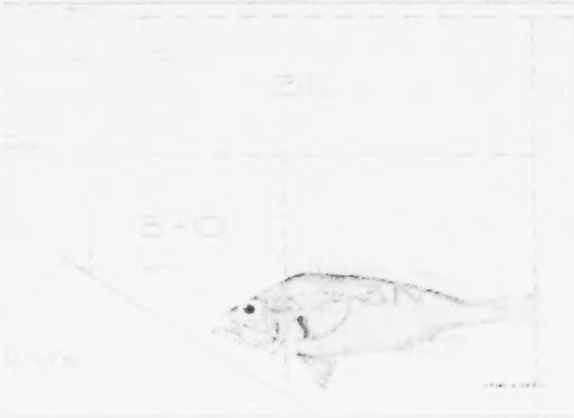
Scotia Fundy Mobile Gear Fishermen's Association – Brian Giroux (2001-010-00232)

Council's Views on Stock Status

Overall Stock Condition:	apparently stable
	Compared to average
Spawning Biomass:	uncertain but apparently stable
Total Biomass:	uncertain but apparently stable
Recruitment:	moderate; less intermittent than other redfish stocks, <22 cm declined recently
Growth and Condition:	good; typical for this stock
Age Structure:	stable
Distribution:	harvest has shifted more towards the Gulf of Maine in recent years
Recent Exploitation Level:	uncertain *

* While DFO refers to the underestimation of the total biomass and to the probability that exploitation remains below $F_{0.1}$, the Council notes that recent catches have approximated ½ of the available TAC and also makes note of the opinion that redfish stocks feature recruitment and growth characteristics that are substantially different from other species, and therefore that they may not be managed to best advantage under the yield-per-recruit model based on the $F_{0.1}$ level of exploitation. It is expected that the development of a longer term management strategy will explicitly set a reasonable target harvest rate for this stock.

REDFISH - 3O



PERSPECTIVE

Redfish is a long lived species with a relatively low fecundity rate. The mature stock biomass is supported by few strong year classes, usually appearing about every ten years. The redfish stock in 3O is heavily exploited before year classes reach sexual maturity. In addition there is an increasing exploitation on the stock by foreign fleets fishing outside the 200 mile limit. This foreign fishery is unregulated and in recent years the TAC has been exceeded.

In November 1993, the Council recommended reduction of the TAC to 10,000t for 1994. The Council later recommended that a small fish protocol be established to protect juvenile redfish and that research be accelerated to determine the origin of the small fish found in this Division.

An Atlantic-wide conference call was held on November 28, 2001 and industry representatives provided oral and written briefs at consultations in Placentia, Marystown and Harbour Breton in November. Some participants noted that the prevalence of small fish (<22 cm) in the catch continued to increase, likely due to the recruitment to the fishery of small fish (12 - 19 cm) observed in earlier research surveys. Participants acknowledged that varying catches were a result of fluctuations in demand for these smaller-sized redfish.

ANALYSIS

The 2000 DFO Stock Status Report indicates that:

- The recent Spring and Fall research vessel surveys suggest the survey biomass may be declining from the previous estimates of 100,000t.
- The small redfish tracked by research surveys in earlier years are recruiting to the fishery, but there is concern that there has been little sign in recent research surveys of size groups smaller than 17cm.
- It is still not possible to describe overall trends in total stock size or to estimate the current size of the fishable portion of the population, nor is it possible to determine current fishing mortality rate.
- Recent survey results suggest that catches averaging 10,000t over the last number of years appear to have been sustainable.

Recent stock affinity studies suggest that redfish in this management unit are different from those in Units 1 to 3. It is important that the results of these studies be confirmed and that the relationship between these redfish and other neighboring management units be considered further.

The Council notes that biomass estimates of this stock remain uncertain due to the nature of the bottom in this management unit and the apparently related distribution of fish by size. The FRCC has noted that there has been a shift in the distribution of the fishery during 2000 as compared with recent years, and that the large majority of the 2000 catch was taken from 3Oe, in the eastern-most portion of the management unit.

The Council also feels that the relative abundance of small (<17cm) redfish in research surveys might be an important indicator for this stock, since recent juvenile year classes seem to have been tracked for a time by earlier surveys and are now observed in the commercial fishery. The Council is sensitive that the relative shortage of such small fish in current research surveys might foretell reduced recruitment to coming commercial fisheries. However, the Council also understands that the most appropriate long term exploitation strategy for this stock needs to be considered within the context of the unusual pattern of recruitment for redfish stocks and the capabilities of science and industry to monitor and quantify changes in stock size and characteristics.

The FRCC recommends that the TAC for 2002/2003 for 30 redfish be set at 10,000t.

The Council observes that the renewed interest the foreign fleets have taken in this resource outside 200 nautical miles in the unregulated fishery appears to be continuing. It seems likely that the total catch will continue to exceed the established TAC for 3O redfish.

Figures are in 000t

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001*
TAC	20	20	20	14	14	14	14	14	14	10	10	10	10	10	10	10	10
Catch	12.9	11.1	13.2	11.2	11	9	7.6	20.6	13.1	4.4	2.8	9	4.7	9.1	12.5	12.80	4.77

*Canadian Catch as of Dec 12/01

1. Figures are from the Integrated Fisheries Management Plan Atlantic Groundfish

Given this trend the currently recruiting year class is increasingly vulnerable to over-exploitation.

The FRCC recommends that DFO develop an effective plan to bring fishing effort on 3O Redfish under control outside 200 nautical miles.

The Council recognizes the recent implementation of the small fish monitoring and reporting system to address the well documented pattern of landing small redfish from this management unit, and feels that this initiative must be continued in future years.

The FRCC recommends that the small fish protocol be applied to all fleets harvesting the resource throughout the range of the stock, and that it be rigorously enforced.

Sources

DFO Science

A1-01 (2000) Status of Redfish Stocks in the Northwest Atlantic: Redfish in Units 1, 2, and in Division 3O

FRCC Consultations

Placentia, NF (November 19)
Marystown, NF (November 20)
Harbour Breton, NF (November 21)
Conference Call (November 28)

Written Briefs

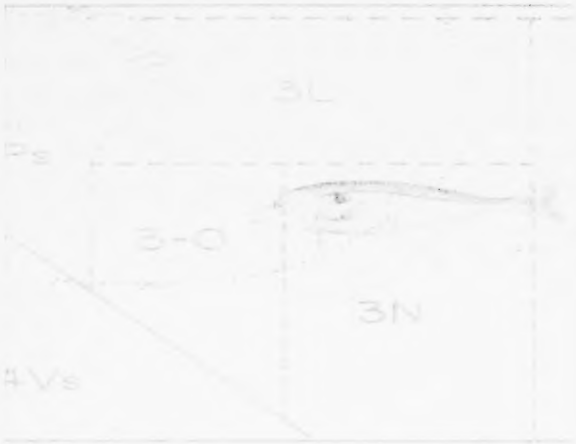
Groundfish Enterprise Allocation Council (2001-010-00250)

Council's Views on Stock Status

Overall Stock Condition:	stable
	Compared to average
Spawning Biomass:	uncertain
Total Biomass:	apparently stable
Recruitment:	good, may decline
Growth and Condition:	good; typical for this stock
Age Structure:	uncertain
Distribution:	unchanged
Recent Exploitation:	uncertain

Chapter 4: Newfoundland Groundfish Stocks, Stock by Stock Recommendations

HADDOCK - 3LNO



PERSPECTIVE

Haddock is a bottom-dwelling species that feeds mainly on small invertebrates. The Grand Banks haddock stock was one of the most dominant species in the area historically. The stock was very heavily exploited by trawlers in the 1960-70's and during this period the stock collapsed. The stock has remained at a relatively low level up to present.

The FRCC held public consultations on this stock in Placentia, Marystown, and Harbour Breton in November, 2001. Stakeholder comments referenced the high abundance of this stock historically and the need to rebuild the stock in the context of an ecosystem approach.

In November 1993, the Council recommended that removals be limited to a by-catch fishery with a precautionary ceiling of no more than 500t. In order to prevent a repeat of the heavy exploitation that was exerted in the mid-1980s on the 1980 and 1981 year classes, the Council recommended that there be no directed fishing for the 3LNO haddock stock in 1994 and that by-catches be limited to 500t. In 1995 the FRCC recommended reducing the by-catch limit to 100t. Since 1998, the Council recommended continuation of the prohibition on directed fishing and that restrictive by-catch protocols be applied when prosecuting other fisheries.

ANALYSIS

There was no new scientific information available in 2001. The 2000 DFO Newfoundland Region Groundfish Overview indicates that:

- The 1998 year class may be strong, but the significance of this year class is unknown.
- If the current moratorium on cod and plaice continues and mesh size and by-catch regulations in the yellowtail fishery are adhered to, fishing pressure on the 1998 year-class should be low.

Haddock abundance in 3LNO was low throughout the 1970s, higher in 1984-1988, and subsequently low. There is no new information available from the most recent research vessel survey. Fish that reach spawning age must be protected if recruitment is to improve in the future for this stock.

The FRCC recommends that there be no directed fishing for 3LNO haddock in 2002/2003 and that there be a restrictive by-catch fishery only.

Information from 1998, 1999 and 2000 surveys suggest the possibility of a good 1998 year class. Given that this used to be a major fishery until the 1960s, the Council believes that measures must be adopted to protect this year class. It is believed that the current NAFO moratorium on various stocks in this area, as well as restrictions on the 3LNO yellowtail fishery, will assist in the protection of this year class.

The FRCC recommends that DFO Fisheries Management monitor closely the by-catch of 3LNO haddock and establish management protocols to ensure fishing mortality is minimized on the 1998 year class.

Figures are in 000t

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001*
TAC	--	--	4.1	8.1	8.1	10	4.1	4.1					by-catch				
Catch	4	7.8	5.7	8.1	6.1	3.1	1.1	0.9	0.8	0.01	0.022	0.09	0.33	0.31	0.09	0.06	0.09

*Catch as of Dec. 12/01

1. Figures are from the Integrated Fisheries Management Plan Atlantic Groundfish

Council's Views on Stock Status

Overall Stock Indicator:	low
	Compared to average
Spawning Biomass:	low
Total Biomass:	low
Recruitment:	production of young haddock has been poor since 1980-81 but indications from the 1998-2000 surveys suggest improvement
Growth and Condition:	not available
Age Structure:	unknown
Distribution:	unknown
Recent Exploitation Level:	unknown; fishing pressure likely reduced due to moratoria on cod and flatfish, and to reduced by-catch limits

Sources

DFO Science

SSR A2-19 (2000) Newfoundland Region Groundfish Overview

FRCC Consultations

Placentia, NF (November 19)
Marystown, NF (November 20)
Harbour Breton, NF (November 21)

Written Briefs

No briefs received

REDFISH - 2+3K

Although there are early indications of pulses in certain yearclasses, recruitment would require a minimum of 10 years before it would contribute to any fishery. No directed commercial fishing on this stock is justified.

The FRCC recommends that there be no directed fishing of 2+3K redfish in 2002/2003 and that there be a restrictive by-catch fishery only.

The FRCC recommends that a scientifically based test fishery of up to 200t be established to provide further data on the redfish in the area and its possible linkage to redfish in 1F.

PERSPECTIVE

Redfish is a long-lived species with relatively low fecundity. The spawning stock biomass that supports a fishery is comprised of generally few strong year classes. These year classes usually appear one in each decade. The FRCC held public consultations on this stock in Placentia, Marystown, and Harbour Breton during November 2001. Stakeholders indicated that there is possible linkage between 1F and 2+3K redfish and that a limited quota should be established to conduct a study of the area.

In 1993, the Council observed that, given the very low level of this stock, the TAC of 20,000t was too high and recommended, as a precautionary measure, that the 1994 TAC for the 2+3K redfish stock be set at 1,000t. Since 1995, the Council has recommended that any directed fishery, should it be allowed, be carried out within the framework of a scientifically coordinated test fishery and that a nominal amount of 200t be provided for that purpose.

ANALYSIS

The 2001 DFO Science Stock Status Report indicates:

- DFO surveys continue to indicate the resource is at a very low level with poor recruitment for the past 25 years.
- Stock structure is poorly understood, particularly the relationship between redfish in SA2+Div. 3K and those in Davis Strait and the Irminger Sea pelagic stock.

Figures are in 000t

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001*
TAC	35	35	35	35	35	35	20	20	20	1	0.2	0.2	Moratorium				
Catch	31.5	30.3	20.8	6.9	3.3	2.4	2.6	0.02	0.05	0.01	0	0	0.002	0.003	0.002	0.018	0.026

*Catch as of Dec. 12/01

1. Figures are from the Integrated Fisheries Management Plan Atlantic Groundfish

Sources

DFO Science

SSR A2-15 (2001) SA2+Div. 3K Redfish

FRCC Consultations

Placentia, NF (November 19)
Marystown, NF (November 20)
Harbour Breton, NF (November 21)

Written Briefs

No briefs received

Council's Views on Stock Status

Overall Stock Indicator:	extremely low
	Compared to average
Spawning Biomass:	very low
Total Biomass:	very low; less than 10% of 1978-90 average estimate
Recruitment:	very poor
Growth and Condition:	not available
Age Structure:	unknown
Distribution:	unknown
Recent Exploitation Level:	low

American Plaice - 2+3K

- Estimates of seal consumption is about 15,000t of American plaice in 2J3KL.
- In recent years recruitment has been low.
- Estimates of total mortality are greater than 0.7 despite low catches.
- Little prospect of recovery in the foreseeable future.

The FRCC recommends that there be no directed fishing for 2+3K American plaice during 2002/2003 and that there be a restrictive by-catch fishery only.

The FRCC recommends that co-operative science-industry surveys be developed to increase the data base for this stock.

Perspective

American plaice are a bottom-dwelling fish that are primarily associated with mud and sand bottoms. Like other flatfishes found along the Atlantic coast they are asymmetrical, both eyes lying on one side of a highly flattened body. Plaice lie on the bottom on their blind side. Their principal food include crustaceans, molluscs, and small fishes. The stock in 2+3K has declined sharply during the past decade despite no fishing pressure. It is generally thought that this decline is related to poor environmental conditions for plaice over the stock area.

In November 1993, the Council noted that the spawning biomass was far below any previous level and that there were no signs of good recruitment for this stock. Since this time, the Council has recommended that there be no directed fishing for 2+3K American plaice and that by-catches be limited.

The FRCC held public consultations on this stock in Placentia, Marystown, and Harbour Breton during November 2001. There were no stakeholder comments on this stock.

Analysis

There was no new scientific information available in 2001.

The 2000 Stock Status Report (SSR) indicated that:

- Biomass has remained low since 1992 and is currently estimated to be about 6% of the 1980-84 average.

Figures are in 000t

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001*
TAC	10	10	10	10	10	10	10	10	5				by-catch				
Catch	0.8	3	1	0.9	4.1	1.8	0.5	0.07	0.01	0.01	0.02	0.006	0.006	0.006	0.007	0.06	0.1

*Catch as of Dec. 12/01

1. Figures are from the Integrated Fisheries Management Plan Atlantic Groundfish

Sources

DFO Science

SSR A2-11 (2000) American plaice in Subarea 2 and Division 3K

FRCC Consultations

Placentia, NF (November 19)
Marystown, NF (November 20)
Harbour Breton, NF (November 21)

Written Briefs

No briefs received

Council's Views on Stock Status

Overall Stock Indicator:	very low
	Compared to average
Spawning Biomass:	very low
Total Biomass:	very low; recent estimates only 6% of early 1980s
Recruitment:	poor
Growth and Condition:	not available
Age Structure:	gradual reduction in number of older fish; all age groups depressed
Distribution:	moved to deeper water in late 1980s
Recent Exploitation Level:	low; by-catch only

Witch Flounder - 2J3KL

Perspective

Witch are a bottom-dwelling fish that are primarily associated with mud bottom. Like other flatfishes found along the Atlantic coast they are asymmetrical, both eyes lying on one side of a highly flattened body. Witch inhabit the deep slope waters along the northern shelf of the 2J3KL areas. The stock has declined sharply during the past decade as a result of over exploitation and is currently at a very low level. Recent evidence indicates that the stock has migrated into the 3M area and is exposed to fishing pressure in the deep waters of the Flemish Pass.

In 1993, the Council noted that the biomass of witch flounder in 2J3KL was far below any previous estimate in the 15-year time series, and consequently recommended that, as a precautionary measure, the TAC be reduced to 1,000t. Since 1994, the Council has recommended that there be no directed fishing for the stock and that by-catches be limited.

The FRCC held public consultations on this stock in Placentia, Marystown, and Harbour Breton in November 2001. No stakeholder comments were received on this stock.

Analysis

The 2001 Report of the NAFO Scientific Council indicates that:

- This stock remains at a very low level.
- There are some indications of movement to deeper waters of 3L.

Witch is a slow-growing species that may live to 30 years. Age groups in the 2J3KL stock have been reduced substantially since the 1970s. There are fewer older fish now. Fishing has generally taken fish from pre-spawning and spawning concentrations. Recently, witch appears to have moved to deeper water (in excess of 900 m). Recent data on this stock indicate that it has dramatically declined since the 1980s; relative biomass in 1994 was estimated to be 4% of the 1986 level. Research surveys in 1996 found that witch was somewhat more abundant in the Flemish Pass area which could make it vulnerable to by-catch in the turbot fishery outside 200 miles and may have migrated from Canadian waters. Generally, the stock is at the lowest level ever observed and there are no signs of improving recruitment. The shrinking area of distribution of this stock, despite its low biomass, may increase its vulnerability to fishing.

The FRCC recommends that there be no directed fishing for 2J3KL witch flounder in 2002/2003 and that there be a restrictive by-catch fishery only.

The FRCC recommends that Canada seek to implement within NAFO a moratorium on directing for witch flounder in area 3M.

Figures are in 000t

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001*
TAC	8	8	6	5	5	4	4	4	4	1	by-catch				Moratorium		
Catch	3	3.9	4.5	3.9	4.9	3.9	4	2.6	0.4	0.6	1.3	1.7	1.2	1.1	0.38	0.39	0.01

*Catch as of Dec. 12/01

1. Figures are from the Integrated Fisheries Management Plan Atlantic Groundfish

Sources

NAFO

NAFO Scientific Council Reports - 2001

FRCC Consultations

Placentia, NF (November 19)
Marystown, NF (November 20)
Harbour Breton, NF (November 21)

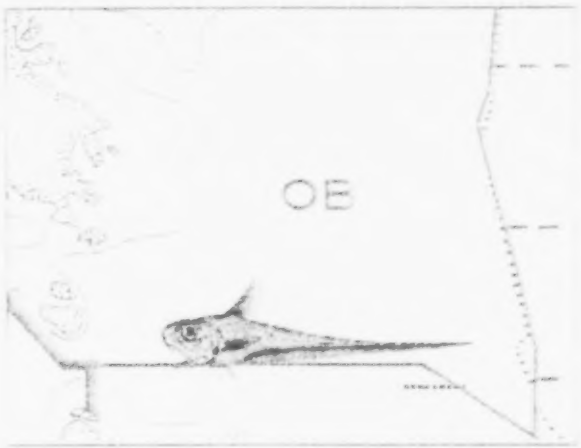
Written Briefs

No briefs received

Council's Views on Stock Status

Overall Stock Indicator:	very low
	Compared to average
Spawning Biomass:	very low
Total Biomass:	very low
Recruitment:	poor; no signs of improvement
Growth and Condition:	not available
Age Structure:	not available
Distribution:	shrinking; may have migrated to deeper waters in early 1990s
Recent Exploitation Level:	appears low but if stock has migrated to deeper waters outside the Canadian zone, could be vulnerable to unregulated fishing

Roundnose Grenadier - Sub-Area 0



Perspective

Grenadier are a deep water species that occur off the slopes of the northern part of the Grand Bank northward to the Davis Strait. The stock has been overexploited in recent decades and has remained at a very low level of abundance over the past decade. In 1993 the Council recommended the TAC for Sub-area 0 roundnose grenadier be set at 3,000t. The Council recommended in 1995 that there be no directed fishery on this stock and cooperative industry-science surveys should be encouraged.

The FRCC held public consultations on this stock in Placentia, Marystown, and Harbour Breton during November 2001. No stakeholder comments were received on this stock.

Analysis

The NAFO Scientific Council Report notes that the stock found in the Davis Strait is probably connected to the other stocks in the North Atlantic. The stock component found in sub area 0 +1 is at the margin of the distribution area. Previous Canadian and Russian surveys showed that most of the biomass generally was found in sub area 1. The exploitation level is considered to be low in recent years and the stock seems to be at very low levels. The Scientific Council recommends that there be no directed fishing.

The FRCC recommends that there be no directed fishing for roundnose grenadier in sub area 0 in 2002/2003 and that there be a restrictive by-catch fishery only.

Figures are in 000t

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001*
TAC	4	4	4	4	4	4	4	4	4	4	1			Moratorium			
Catch	0.2	0.008	0.01	0.5	0.08	0.29	0.19	0.11	0.05	0	0	0	0.002	0	0	0.003	0.01

*Catch as of Dec. 12/01

1. Figures are from the Integrated Fisheries Management Plan Atlantic Groundfish

Sources

NAFO

NAFO Scientific Council Reports - 2000

FRCC Consultations

Placentia, NF (November19)
Marystown, NF (November 20)
Harbour Breton, NF (November 21)

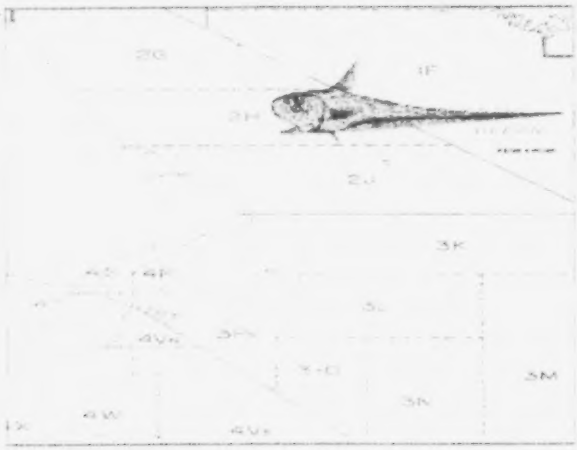
Written Briefs

No briefs received

Council's Views on Stock Status

Overall Stock Indicator:	very low
	Compared to average
Spawning Biomass:	likely low (unspecified)
Total Biomass:	very low
Recruitment:	not available
Growth and Condition:	not available
Age Structure:	not available
Distribution:	unknown
Recent Exploitation Level:	low

ROUNDNOSE GRENADIER - 2+3



PERSPECTIVE

Grenadier are a deep water species that occur off the slopes of the northern part of the Grand Bank northward to the Davis Strait. The stock has been overexploited in recent decades and has remained at a very low level of abundance over the past decade. In 1993 the Council recommended that the TAC for roundnose grenadier be set at 4,000t. This TAC was reduced to 500t in 1995 and in 1997 the FRCC recommended there be no directed fishing on roundnose grenadier in Sub Area 2+3.

The FRCC held public consultations on this stock in Placentia, Marystown, and Harbour Breton during November 2001. No stakeholder comments were received on this stock.

ANALYSIS

The most recent report of the NAFO Scientific Council notes that due to limited data it is not possible to determine the state of the stock and was therefore not able to provide any advice.

The FRCC recommends that there be no directed fishing for roundnose grenadier in 2+3 in 2002/2003 and that there be a restrictive by-catch fishery only.

Figures are in 000t

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001*
TAC	11	11	11	11	11	11	11	11	11	3	3	1		Moratorium			
Catch	4.9	7.4	8.3	6.3	4.9	3.9	5	7	4.4	4	4	4.2	3.5	0.12	0.23	0.2	0.16

*Catch as of Dec. 12/01

1. Figures are from the Integrated Fisheries Management Plan Atlantic Groundfish

Sources

NAFO

NAFO Scientific Council Report 2000

FRCC Consultations

Placentia, NF (November 19)
Marystown, NF (November 20)
Harbour Breton, NF (November 21)

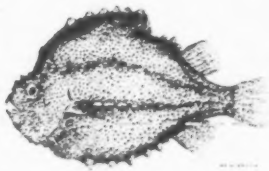
Written Briefs

No briefs received

Council's Views on Stock Status

Overall Stock Indicator:	unknown
	Compared to average
Spawning Biomass:	unknown
Total Biomass:	unknown
Recruitment:	unknown
Growth and Condition:	unknown
Age Structure:	unknown
Distribution:	unknown
Recent Exploitation Level:	unknown

LUMPFISH



PERSPECTIVE

Lumpfish are harvested in the coastal waters of Newfoundland and the fishery has been managed under an effort system that limits fishing seasons and gear within defined coastal zones. There is little scientific knowledge on the resource and no specific research is conducted on the stock. The FRCC held public consultations on this stock in Placentia, Marystown, and Harbour Breton during November 2001. Lumpfish landings were low in 2001 and the fishery was only open for three weeks with appropriate limits on gear as well.

The FRCC first reported on this stock in 1995. The Council recommended that management measures, such as shortened season, be used to reduce the effort on this stock. In October 1996, the Council recommended that new management measures be taken to ensure conservation of lumpfish and that these measures include a combination of the following:

- Roe content monitoring programs should be established to determine timing of the fishery to maximize yield/fish.
- Closed and protected spawning areas must be established throughout the range of the stock.
- More localized management must be established.
- Low effort must be maintained.
- Gear limits and the shortened season should be maintained.

Since 1998 the Council re-iterated that fishers and Science gather more specific information on this stock through an Index Fisherman Program.

ANALYSIS

There was no new scientific information available in 2001. The 2000 DFO Newfoundland Region Groundfish Overview indicates that:

- There are no scientific investigations to determine the current status of this stock.
- Surveys are not useful in evaluating this resource due to relative inshore distribution of the stock compared to survey coverage.

Lumpfish males establish breeding territories inshore; these may be used year after year. Data from studies which have monitored these territories indicate exceptional impact from the fishery. The lumpfish fishery is exclusively on pre-spawning mature females and therefore the spawning stock is vulnerable to over exploitation. Since the cod moratorium, there has been an increase in fishers entering this fishery. Research vessel surveys are not considered to be representative of the stock due to the seasonal migratory pattern of this species. There is insufficient new data to determine the status of this resource.

The FRCC recommends that measures taken to control effort in the past few years be continued.

The FRCC also notes that the inshore nature of this stock lends itself to more local community-based research.

The FRCC recommends that fishers and managers assess their local stocks and implement appropriate conservation measures in agreement with the local stock status, e.g., full closures, rotating local closures, shortening seasons, effort reductions, and the Department provide the Council with the fishery status by these local areas at the end of the season.

Since this fishery is very localized the FRCC believes that programs be encouraged with local fishermen to get data on the stock. Consequently, the FRCC continues to repeat the recommendation below.

The FRCC recommends that fishers and science gather more information on this stock through the establishment of an Index Fishermen Program especially with respect to: catch and effort levels, spawning patterns, growth rates, maturation,

Figures are in 000t

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001[1]
TAC																	
Catch	1	1.5	4	3.3	2.3	1.2	2.1	1.9	2.4	1.5	1.2	1.5	2.26	1.1	2.2		

1. Figures are from the Integrated Fisheries Management Plan Atlantic Groundfish

population structure, temperature preferences and habitat preferences. Further recommendations for continuation of this fishery is incumbent upon information of this nature being provided to the council.

Sources

DFO Science

SSR A2-19 (2000) Newfoundland Region Groundfish Overview

FRCC Consultations

Placentia, NF (November 19)
Marystown, NF (November 20)
Harbour Breton, NF (November 21)

Written Briefs

No briefs received

Council's Views on Stock Status

Overall Stock Indicator:	unknown
	Compared to average
Spawning Biomass:	unknown
Total Biomass:	unknown
Recruitment:	unknown
Growth and Condition:	not available
Age Structure:	fishery is exclusively on mature females before spawning
Distribution:	seasonal migratory patterns; fishing concentrated on in-shore spawning areas
Recent Exploitation Level:	fishery regulated by effort; number of participants in fishery increased since cod moratorium; number of nets allowed and duration of fishery have been reduced in recent years

COD - 2GH

PERSPECTIVE

Cod are the dominant groundfish species throughout most of the waters of Atlantic Canada. Cod inhabit waters from the inshore coastal areas to the deeper waters to the edge of the continental shelf. Cod in area 2GH generally grow relatively slowly as they are at the northern most extent of their range in this area. Cod feed mainly on capelin and other small fishes in this area. The abundance of cod in this area has been very low for about two decades following very high exploitation by the fishery in the decades of the 60's and 70's.

In 1993, the Council recommended that the TAC for 2GH cod be set at 1,000t as a precautionary measure and since 1996 the FRCC has recommended no directed fishing take place on this stock and cooperative industry science surveys should be encouraged.

The FRCC held public consultations on this stock in Placentia, Marystown, and Harbour Breton in November 2001. No stakeholder comments were received on this stock.

ANALYSIS

There was no new scientific information available in 2001. The 2000 DFO Newfoundland Region Groundfish Overview indicates that:

- There has been no reported catch of 2GH cod since 1991.
- The surveys conducted from 1996-1998 detected very few fish and in 2000 the 2G component of the survey was dropped and 2H is to be surveyed in alternating years.
- The status remains unknown but abundance is assumed low.

There is very limited information on this stock. The shrimp fishery in the area uses the Nordmore grate which reduces the capture of this species.

The FRCC recommends that there be no directed fishing for 2GH cod in 2002/2003 and that there be a restrictive by-catch fishery only.

Figures are in 000t

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
TAC	20	20	20	20	20	20	20	20	1	1	0.2	0.2		Moratorium			
Catch	0.64	0.5	0.13	0.4	0.43	0.23	0	0	0	0	0	0	0	0	0	0	0

1. Figures are from the Integrated Fisheries Management Plan Atlantic Groundfish

Sources

DFO Science

SSR A2-19 (2000) Newfoundland Region Groundfish Overview

FRCC Consultations

Placentia, NF (November 19)
Marystown, NF (November 20)
Harbour Breton, NF (November 21)

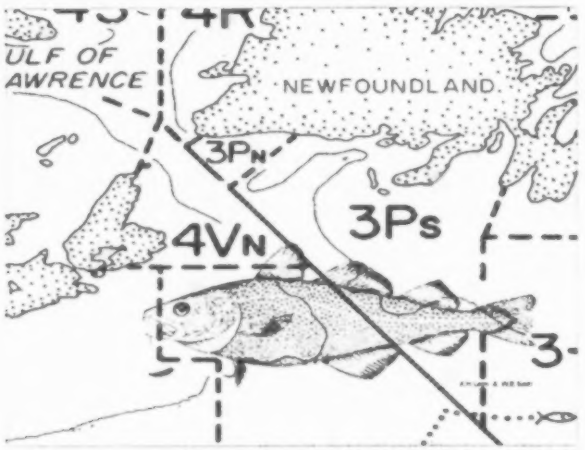
Written Briefs

No briefs received

Council's Views on Stock Status

Overall Stock Indicator: :	very low, status unknown
	Compared to average
Spawning Biomass:	unknown
Total Biomass:	unknown
Recruitment:	unknown
Growth and Condition:	unknown
Age Structure:	unknown
Distribution:	unknown
Recent Exploitation Level:	none - no fishery

Cod - 3Ps



Perspective

Currently the focus of the largest cod fishery in Atlantic Canada, the management area for this stock extends from Cape St. Mary's to west of Burgeo Bank, and south over St. Pierre Bank to the edge of the Laurentian Channel. The stock is composed of a number of sub-components whose relationship is not well understood. Seasonal migrations both within the stock from the offshore to the inshore and back, as well as migrations across stock management boundaries confound the understanding of the dynamics of this stock.

Catches from this stock have supported an inshore fixed gear fishery in southern Newfoundland for centuries. Fish are also caught offshore on the St. Pierre and Burgeo Banks, among others. Prior to the extension of Canadian jurisdiction, this stock was heavily exploited by non-Canadian fleets, mainly from Spain. Through the 1980s, fishing effort by Canada and France peaked in 1988 with landings of 59,000t.

In August 1993, the low estimates of biomass for this stock led the Council to recommend that fishing be discontinued, at least until April 30, 1994. The fishery was closed by DFO in September 1993. While the Council indicated in its November 1993 report that recommendations for this stock would be forthcoming following the analysis of the results of the spring survey, such a review was made unnecessary when the fishery was closed by the Minister of Fisheries and Oceans for the whole year.

In November 1994, the Council recommended that there be no directed fishing for 3Ps cod in 1995 and that by-catches be kept to the lowest possible level.

The Council also recommended that efforts be made to expand surveys into inshore areas, and that a broad-based Sentinel Fishery program be implemented. The Council's recommendations for 1996 were for a continued moratorium and a significantly expanded Sentinel Fishery.

In 1997 the FRCC recommended a limited commercial fishery with a TAC of 10,000t. In March 1998, the Council recommended that the TAC for this stock be set at 20,000t, but that measures be taken to disperse the total catch over the fishing year to minimize impacts on stock sub-components. In March 1999, based on the positive outlook in the stock status report and the overwhelmingly optimistic views of industry, the FRCC recommended that the TAC be set at 30,000t. Additional recommendations were made that were intended to enhance the age structure by increasing the survival rate of older fish, to protect 4RS3Pn fish overwintering on Burgeo Bank, and improve the reliability of the trawl survey.

In 2000, based on a revised outlook for the stock the FRCC recommended the TAC be reduced to 20,000t. In addition, the FRCC recommended the closure of several known spawning areas and further restrictions on the use of gillnets in the fishery. For 2001/2002, the FRCC recommended the TAC be set at 15,000t for 2 years, and that a reduction might be appropriate if pessimistic assessments were confirmed. The Minister implemented a one year TAC of 15,000t for 2001/2002. The FRCC expressed strong views about the lack of sustainable conservation measures in this stock and made several prescriptive recommendations in an attempt to correct this. The FRCC was of the view that without significant change in the fishery, the stock would likely continue to decline.

The FRCC conducted public consultations in Placentia, Marystown, and Harbour Breton, Newfoundland in October and November 2001. Stakeholders were nearly unanimous in their views that: 1) this stock should be allowed to grow from current levels thought to be well below historical averages; 2) the harvest level of the past year (15,000t), but not previous years (20,000-30,000t), should allow for moderate growth in the stock; 3) some previous recommendations of the FRCC had undesirable effects, in particular with regard to discarding of immature fish for which there is no commercial market; 4) recruitment of young fish appeared strong beginning in 1999 (which would indicate that the1997 year class and perhaps subse-

Figures are in 000t

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001*
TAC	41	41	41	41	35.4	35.4	35.4	35.4	20	Moratorium			10	20	36	20	15
Catch	51.4	57.9	54.3	38.6	37.8	40.7	42.4	29.8	14	0.66	0.41	0.20	9.0	19.80	34	19.5	10.87

*Catch as of Dec. 12/01

1. Figures are from the Integrated Fisheries Management Plan Atlantic Groundfish

quent year classes are relatively strong), and 5) there is a need for earlier recognition of year-class strength. There was recognition that a combination of warmer ocean conditions in the 1996-2000 years and the strong 1989 and 1990 year classes of spawners had resulted in strong recruitment. During the past few years these year classes have been fished too heavily, particularly in Placentia Bay. There were views from industry that TAC stability should be a goal in this fishery, and that the current quota was in line with current stock conservation goals. There was concern expressed about the late spring opening of the fishery, but as much concern that spawning stocks be protected.

Strong concerns were expressed by fishermen about regulations that discouraged the use of gillnets in favour of hook and line because the selectivity of hook and line is for smaller fish, many of no commercial value, with increased likelihood of discarding, hygrading, and other waste in the fishery.

Analysis

The paramount FRCC objective for this stock remains the rebuilding of a spawning stock biomass composed of a wide range of ages, particularly of older fish, across all spawning components, while maintaining a fishery. It is therefore important to select conservation measures and TAC that enhance the probability that the spawning biomass will continue to increase and broaden in age structure among all stock components. **There are two fundamental goals: 1) to conserve the spawning stock, including all of its components, and 2) to achieve a higher degree of TAC and management stability.**

FRCC recommendations and management measures of the past four years have failed to fully achieve those objectives.

It was the view of the FRCC that the SSR represented an attempt to provide an unbiased view of the stock status and acknowledged uncertainties in the assessment.

Sources

DFO Science

SSR A2-02 (2001) Subdivision 3Ps Cod

FRCC Consultations

Placentia, NF (November 19)
Marystown, NF (November 20)
Harbour Breton, NF (November 21)

Written Briefs

Fish, Food and Allied Workers – Harvey Jarvis (2001-010-00053)

Fred Windsor (2001-010-00098)

Groundfish Enterprise Allocation Council – Bruce Chapman (2001-010-00250)

Council's Views on Stock Status

Overall Stock Indicator:	stable
	Compared to average
Spawning Biomass:	some decline, near long term average
Total biomass:	stable
Recruitment:	recent years very strong
Growth and Condition:	stable growth, lower than in the 1970s; good condition
Age structure:	fish > 10 years of age rare, 3 and 4 year-olds abundant
Distribution:	normal
Recent exploitation Level:	too high in Placentia Bay; moderate elsewhere

The 2001 DFO Stock Status Report indicates that:

- Spawner biomass in April 2001 is estimated to be between 50,000 and 150,000t using various model assumptions, and 85,000t using the same formulation as in 2000. All formulations indicated a declining spawner biomass in 2001. The model used in 2000 indicated an April 2000 biomass of 92,000t, which in turn was down from estimates for January 1999 biomass (106,000t).
- The biomass of fish aged 3 and older in January 2001 is estimated to be 156,000t and to be relatively stable over the past few years.
- Exploitation rates in Placentia Bay well exceeded 20% (24 – 45%) in 1999 and 2000 in many tagging experiments. Exploitation in other areas is believed to be at sustainable levels.
- Estimates of recruitment (numbers at age 3) show a general downward trend over the period 1959 to 1999 with year classes from 1993 to 1996 being particularly low. However, all indices suggest that the 1997 and 1998 year classes are strong, and there is an indication from the 2001 RV survey that the 1999 year class may also be better than average.
- Cold water conditions in the early 1990's were associated with poor recruitment. Warmer conditions and relatively large numbers of the 1989 and 1990 year class fish were associated with the strong year classes of 1997 to 1999. However, in 2000 and 2001 there were declining numbers of larger fish as a consequence of the fishery, which in conjunction with colder ocean conditions in 2001, may lead to lower recruitment.
- Female age at maturity may have increased in the past few years, after maturing at relatively young ages throughout the 1990's. However, size at age has increased somewhat from the very low levels of the mid-1990's.
- For 5 different model formulations, 4 of 5 formulations suggested a less than 5% chance of spawner stock decline in 2003 at harvests of 10,000-20,000 t. The risk of exceeding the limit reference of $F_{0.1}$ was greater than 5% in 2 of 5 formulations for a TAC of 10,000t and 3 of 5 for a TAC of 20,000t.

Fishing mortality on the older fish has been excessive, and a concentration of effort and catch in Placentia Bay threatens the sustainability of local spawning components and fisheries. In addition, there continue to be reports of substantial wastage, discarding, and hygrading in this fishery.

This stock has good potential for growth in the coming years. The 1997 and 1998 year classes appear to be the strongest in many years. However, there has been a substantial reduction of older fish (the 1989 and 1990 year-classes) since 1997, particularly in Placentia Bay. There is now potential to harvest or discard numbers of the incoming juvenile 1997 and 1998 year-classes before they are allowed to spawn and contribute their full potential yield to the fishery. In addition, if the cooling observed in 2001 continues over the next few years and recruitment is low these year classes may have to sustain the fishery for the next decade.

The recommended strategy for this stock is founded on conserving spawning biomass and protecting juveniles, enhancing overall spatial and age structure of the stock, and a TAC based on a reasonably low exploitation rate. This strategy should allow for stock growth and continued stability in the TAC.

In recent years as much as 50% of the catch has been taken from Placentia Bay, which continues to provide a disproportionate amount of the landings relative to the proportion of the stock available to the fishery in this area. Such removals are unlikely to be sustainable. The shockingly high exploitation rates indicated by tagging experiments in Placentia Bay, and comparisons of April biomass levels in the Bay with total biomass, suggest a reduction in exploitation in Placentia Bay to no more than 20% of the TAC would be in line with the objectives for this stock.

The FRCC recommends that effort be distributed over the whole range of the stock, in relative proportion to abundance, and avoid concentration. In particular, the FRCC recommends that to achieve a reduction in the proportion of the catch in Placentia Bay, fishing effort be redirected from Placentia Bay to areas of lower current exploitation.

The Bar Haven area in Placentia Bay is particularly vulnerable to exploitation and has been subjected to extreme concentration of fishing effort in recent years.

The FRCC recommends that in order to protect the sensitive over-wintering and spawning area inside the perimeters of Sound, Woody, and Bar Haven Islands, from Garden Cove and Swift Current to Ship Island, this area continues to be closed to all fishing except by resident fishers. The zone includes a buffer area of approximately 500 m seaward from

the islands. Other ongoing fisheries in the area should continue as normal ie. Lobster, lumpfish.

The FRCC is of the view that in order to increase the biomass of this stock all components require protection during the spawning season.

The FRCC recommends that the following closures to all directed cod fishing be implemented:

a) **the St. Pierre Bank and adjacent shelf areas including the Halibut Channel area of 3Ps (3Psdefgh) from March 1 to June 30.**

b) **all of the coastal zone (3Psabc) from March 1 to May 31.**

There is substantial mixing of the 3Ps and 3Pn4RS stocks in winter on Burgeo Bank.

The FRCC recommends that the winter fishing closure on Burgeo Bank from November 15 through April 15 be continued.

There is a pressing need to ensure that the incoming 1997 and 1998 year classes be protected from undue mortality from the fishery. The same applies to the large fish of the 1989 and 1990 year classes. Fisheries should be encouraged that harvest a broad range of sizes of mature fish, in keeping with their representation in the fishable stock.

The FRCC recommends that fisheries not be permitted that target the immature 1997 and 1998 and the larger mature spawning fish of the 1989 and 1990 year classes.

Fishermen reported at consultations that hygrading, discarding and waste in this fishery were too high and not being measured or considered by DFO Science or Fisheries Management.

The FRCC recommends that DFO monitor and control hygrading, discarding, and waste in this fishery. The FRCC also recommends that data from observer reports be summarized and made available for the RAP and consultations.

Tagging studies and the RV and GEAC trawl surveys give highly uncertain measures of the spawner biomass on St. Pierre Bank and its adjacent regions.

The FRCC recommends that spawner abundance on St. Pierre Bank and environs be separately and more precisely estimated, and that alternative survey and assessment methods be considered.

There is a need to develop a recruitment index for this stock. Fishermen's observations of an increase in small cod since 1999 are consistent with the strength of the 1997 and 1998 year classes.

The FRCC recommends that DFO Science and industry cooperate to develop a recruitment index to be based on a scientific survey of fishermen's observations.

The FRCC believes that there is strong potential for growth in this fishery, and with the above conservation measures implemented, there is scope for increase in the TAC in coming years. However, the FRCC cautions that the recommended TAC will be lower in coming years if immature fish and older fish are targeted, or if the concentration of effort in Placentia Bay cannot be reduced.

The FRCC recommends that the 2002/2003 TAC for 3Ps cod be set at 15,000t.

American Plaice - 3Ps

Perspective

American plaice is a flatfish species found on both sides of the Atlantic. Its east Atlantic common name is long rough dab. It is found over a wide range of depths and temperatures as far north as arctic waters. This is a relatively slow growing species, females maturing at about age 9 at a size of about 36cm. Catches from the 3Ps stock were highest from 1968 to 1973 when they averaged over 10,000t but since 1980 catches have exceeded 5,000t only twice. The stock has been under moratorium since September 1993.

The FRCC held public consultations on this stock in Placentia, Marystown and Harbour Breton, during November 2001. Due to pressure of other business there was relatively little comment on this stock at the consultations. As in recent consultations, stakeholders continue to indicated a growing presence of American plaice in the bays and in the harvest of other directed fisheries in the 3Ps area. Some suggested a limited directed fishery using the appropriate gear type should be opened. There has been no action on the inshore test fisheries proposed in the previous FRCC recommendations.

Analysis

There was no new scientific information for 2001.

The 2000 DFO Newfoundland Region Groundfish Overview indicates that:

- Catches in recent years are increasing due to increasing by-catches, especially in the 3Ps cod fishery.
- The 2000 survey showed increases in abundance and biomass yet estimates are well below those of 1983-1987.
- There is little prospect of significant rebuilding in the short to medium term.

The 1999 SSR indicated that total mortality remained high in 1994 and 1995 following the imposition of the moratorium despite low catches.

The inshore fishermen continued to note that they observe increased abundance of plaice over a wide distribution. The GEAC surveys indicate that the stock has increased in recent years with catch rate estimates in the 1999, 2000 surveys and provisional results from the 2001 survey indicating higher catch rates that the 1997 and 1998 surveys.

The FRCC has reviewed the current indicators from the commercial fishery, the trend in by-catches, the most recent SSR and the indications from fishermen throughout the stock area and is of the view that ongoing fisheries for which quotas have been established be permitted to be conducted. The exploitation from the by-catches in these other directed fisheries is low relative to the overall stock biomass.

The FRCC recommends that there be no directed fishing for 3Ps American plaice in 2002/2003.

The FRCC recommends that catches not exceed those required for the normal conduct of fisheries directed towards other species.

The FRCC notes that in the past this stock was an important resource to 3Ps fishers and that it is therefore important that information on this stock be reviewed and enhanced. In the absence of such information becoming available during 2002, the FRCC may consider establishing a small index fishery in 2003/4 to provide further information on this stock. In the meantime the FRCC would encourage focused studies that would enhance knowledge of the status of this stock. They would also encourage focused studies to discover the times, areas and gears where a future American plaice fishery might be conducted with minimal by-catch of other species.

The FRCC continues to recommend that industry in consultation with DFO scientists establish focused scientifically based studies to determine the abundance of plaice in the nearshore waters and bays outside the research vessel and GEAC survey areas; to determine whether the plaice that occur shore-

Figures are in 000t

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001*
TAC	5	5	5	5	5	4	4	4	3	by-catch					Moratorium		
Catch	4.2	5.1	4.9	3.5	3.9	3.9	4.2	2.6	0.3	0.1	0.09	0.66	0.17	0.16	0.82	0.39	0.53

*Catch as of Dec. 12/01

1. Figures are from the Integrated Fisheries Management Plan Atlantic Groundfish

ward of these surveys are distinct from the plaice found in offshore areas including the use of a tagging program; and to report the results back to the FRCC.

The FRCC further recommends that industry in consultation with scientists establish focused scientifically based studies to help establish how a future American plaice fishery might be conducted by area, time and gear type with minimal by-catch of other species.

Sources

DFO Science

SSR A2-19 (2000) Newfoundland Region Groundfish Overview

FRCC Consultations

Placentia, NF (November 19)
Marystown, NF (November 20)
Harbour Breton, NF (November 21)

Written Briefs

4R3Pn- Based Danish Seine Fleet (2001-010-00244)

FFAW - Pius Power (2001-010-00246)

Council's Views on Stock Status

Overall Stock Indicator:	increasing
	Compared to average
Spawning Biomass:	improving
Total Biomass:	increasing
Recruitment:	poor
Growth and Condition:	not available
Age Structure:	all years low recently
Distribution:	increasing in all areas
Recent Exploitation Level:	low; by-catch only

HADDOCK - 3PS

PERSPECTIVE

Haddock, a member of the cod family, are found on both sides of the North Atlantic. In the east Atlantic they are found as far north as the Barents Sea but in Newfoundland waters they are at the northern end of their west Atlantic range. Their abundance in 3Ps depends upon a few larger yearclasses, the occurrence of which are probably related to warmer water temperatures as are the larger yearclasses of haddock in the Barents Sea. Haddock are a bottom feeding species. At smaller sizes their diet is composed largely of bottom dwelling invertebrates (e.g. shrimps, hermit crabs, brittle stars and sea urchins) but larger individuals include small fish in their diet. Their bottom dwelling behaviour should mean that surveys with bottom trawls can track their biomass reasonably.

Catches of 3Ps haddock were generally over 2,000t in the 1960's at which time discarding was often substantial. Catches fell to lower levels in the 1970's and rose in the 1980s to peak at 7,500t in 1985. Catches reduced in the early 1990 and were on a by-catch only basis after 1994.

The FRCC held public consultations on this stock in Placentia, Marystown and Harbour Breton, during November 2001. No stakeholder comments were received on this stock.

ANALYSIS

There was no new scientific information available in 2001.

The 2000 DFO Newfoundland Region Groundfish Overview indicates that:

- The index of biomass peaked in 1985 but declined to low levels in subsequent years.
- The 1998, 1999 and 2000 survey results indicate some increase, but the biomass was still low compared to the mid to late 1980s.
- The 1999 and 2000 surveys showed significant numbers of young haddock which appear as the 1998 yearclass.

A presentation to the 2001 Fall RAP suggested survey estimated biomass and abundance were reduced in 2001 compared to 1999 and 2000 though still higher that the levels of the early 1990's

The FRCC recommends that there be no directed fishing for 3Ps haddock in 2002/2003 and that there be a restrictive by-catch fishery only.

The FRCC recommends that DFO management monitor closely the by-catch of haddock and establish management protocols to ensure fishing mortality is minimized on the 1998 yearclass.

Figures are in 000t

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001*
TAC	--	--	0.15	2.2	3.2	3.2	3.2	3.2	0.5				by-catch				
Catch	7.5	5.3	2.7	2.4	2.9	1.5	0.5	0.5	0.1	0.02	0.04	0.09	0.06	0.075	0.1	0.11	0.05

*Catch as of Dec. 12/01

1. Figures are from the Integrated Fisheries Management Plan Atlantic Groundfish

Sources

DFO Science

SSR A2-19 (2000) Newfoundland Region Groundfish Overview

Presentation to 2001 Fall RAP (Paper 23)

FRCC Consultations

Placentia, NF (November 19)
Marystown, NF (November 20)
Harbour Breton, NF (November 21)

Written Briefs

No briefs received

Council's Views on Stock Status

Overall Stock Indicator:	low
	Compared to average
Spawning Biomass:	low, unknown
Total Biomass:	low, unknown
Recruitment:	some signs of recruitment from 1998 yearclass in 1999 and 2000 survey.
Growth and Condition:	not available
Age Structure:	not available
Distribution:	increased inshore
Recent Exploitation Level:	low, by-catch only

POLLOCK - 3Ps

PERSPECTIVE

Pollock, a semipelagic member of the cod family, is also found in the N.E. Atlantic where it is known as saithe, coalfish or coley (pollock there being the common name of another species). A midwater feeder, the diet of adult pollock is typically of small fish and euphasids. In Newfoundland waters pollock is at the northern end of its range. Adult pollock are typically found in dense concentrations along the slopes of offshore banks. This distribution renders survey estimates of its abundance highly variable. The stock structure of 3Ps pollock is uncertain but the likelihood is that this wide ranging species is linked to the more southerly stock and has extended its range northward in the warmer conditions of recent years. Small pollock are occasionally found in the bays and harbours of southern Newfoundland . Visual surveys of young pollock are used in Norway to provide approximate recruitment indices and similar low cost information might usefully be collected for this stock.

The FRCC held public consultations on this stock in Placentia, Marystown and Harbour Breton, during November 2001. Fishermen continue to suggest that 3Ps pollock appear to be more abundant and there might be enough to justify a directed fishery.

ANALYSIS

There was no new science information available in 2001.

The 2000 DFO Newfoundland Region Groundfish Overview indicates that:

- Historically warmer periods have coincided with higher abundance of pollock in this area.
- Due to the pelagic nature of the species, research vessel surveys (bottom trawl) does not give a reliable index of abundance or biomass.
- In 2000, survey biomass was estimated at only 474t, a significant decline from a recent peak level of 5,700t in 1999.

The FRCC recommends that there be no directed fishing for 3Ps pollock in 2002/2003.

The FRCC recommends catches not exceed those required for the normal conduct of fisheries directed towards other species.

Figures are in 000t

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001*
TAC	--	--	1.5	5.4	5.4	5.4	5.4	5.4					by-catch				
Catch	2.3	7.1	5.0	3.9	3.4	1.7	1.1	0.5	0.06	0.09	0.15	0.13	0.6	0.02	0.74	0.78	0.2

*Catch as of Dec. 12/01

1. Figures are from the Integrated Fisheries Management Plan Atlantic Groundfish

Sources

DFO Science

SSR A2-19 (2000) Newfoundland Region Groundfish Overview

FRCC Consultations

Placentia, NF (November 19)
Marystown, NF (November 20)
Harbour Breton, NF (November 21)

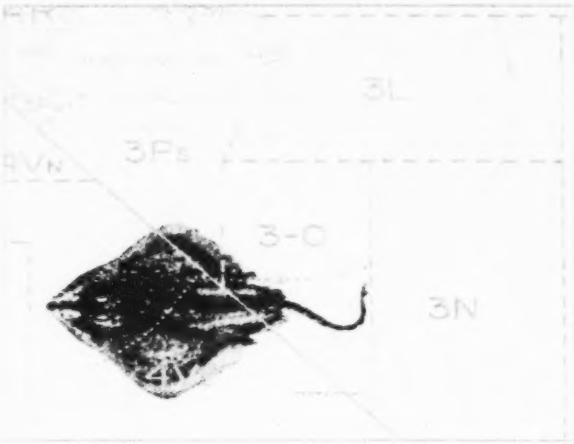
Written Briefs

No briefs received

Council's Views on Stock Status

Overall Stock Indicator:	unknown
	Compared to average
Spawning Biomass:	unknown
Total Biomass:	hard to estimate
Recruitment:	positive signs inshore
Growth and Condition:	unknown
Age Structure:	unknown
Distribution:	sporadic at northern limit of range; may increase with warmer water
Recent Exploitation Level:	low-medium, by-catch

SKATES - 3LNOPS



PERSPECTIVE

Skate are present in the waters along the south coast of Newfoundland on St. Pierre Bank and on the Grand Bank. Skates are slow growing species that produce very few young annually. Skate are therefore, more readily subjected to over-exploitation. A directed fishery for skates developed on the southern Grand Banks during 1993. Council conducted its first review of this stock in 1995 and recommended a precautionary TAC of 2,000t for 1996 for this new fishery. It was further recommended that steps be taken to distribute effort throughout the management area to prevent heavy exploitation on concentrations. Council recommended a 3,000t TAC for 1997 with a provision that it be divided among three separate management units, 3LN, 3O and 3Ps, as defined in the 1996 stock status report. As well, to supplement information gathering on this resource, cooperative industry science initiatives were encouraged.

The FRCC held public consultations on this stock in Placentia, Marystown, and Harbour Breton in November 2001. No stakeholder comments were received on this stock.

ANALYSIS

Of the 8-10 species of skate found in waters around Newfoundland and Labrador, thorny and smooth skates comprise the bulk of catches by commercial fishery and research vessels. Although thorny skates are widely distributed, tagging studies reveal they exhibit limited movement, with re-captured animals found infrequently beyond 100 kms of the site of initial capture.

In comparison to an individual cod which can release millions of eggs a year during a relatively short spawning period, a female skate will lay only 6-40 eggs throughout the year. Special challenges are presented by the limited reproduction potential of this species and insufficient biological information.

The 2000 DFO Newfoundland Groundfish Overview indicated an increase in survey biomass index across the entire stock area from historically low levels in the mid-1990s. Average size of skates is increasing due to the increased number of mature individuals in the population. The implementation of Council's recommendation for three separate management units for 1997 has begun the process of shifting effort across the entire stock area. Due to the sedentary nature of skates and their tendency to form local aggregations, the management over the three divisions appears to be having a positive effect. The serious deficiency of biological and abundance information on this resource has been emphasized. The FRCC is concerned that there continues to be an unregulated fishery outside Canada's 200-mile zone with recent reported catches in the order of 8-10,000t.

The FRCC recommends that 3LN, 30, and 3Ps continue to be treated as separate management areas.

The FRCC recommends that the overall TAC for 3LNOPs skates in the Canadian portion of the zone be set at 3,000t in 2002/2003. This quota should be distributed between management areas, as recommended in the 1996 Stock Status Report.

Figures are in 000t

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001*
TAC											6	2	3	3	3	3	3
Catch	11.4	15.9	19.3	19.5	15.9	14.7	28.4	4.1	5.5	11.5	7.5	5.9	13.7	14.1	13.1	19.1	1.7

*Canadian Catch as of Dec. 12/01

1. Figures are from the Integrated Fisheries Management Plan Atlantic Groundfish

Sources

DFO Science

SSR A2-19 (2000) Newfoundland Region Groundfish Overview

FRCC Consultations

Placentia, NF (November 19)
Marystown, NF (November 20)
Harbour Breton, NF (November 21)

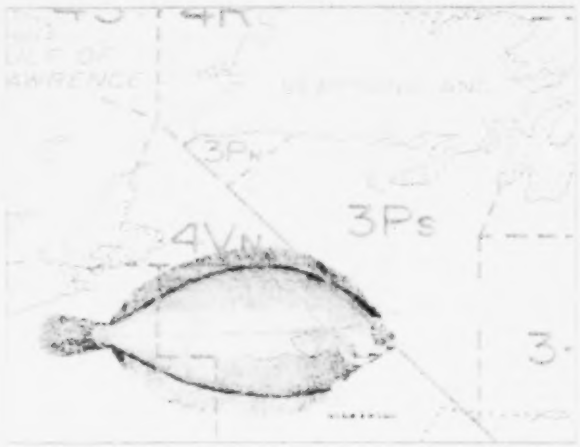
Written Briefs

No briefs received

Council's Views on Stock Status

Overall Stock Indicator:	increasing trend
	Compared to average
Spawning Biomass:	unknown
Total Biomass:	recovering, improving trend
Recruitment:	unknown
Growth and Condition:	not available
Age Structure:	improving
Distribution:	local concentrations
Recent Exploitation Level:	increasing in the unregulated foreign fishery

WITCH FLOUNDER - 3PS



PERSPECTIVE

Witch flounder is a deepwater flatfish species. In the west Atlantic it is found as far north as southern Labrador waters. It is a long lived, slow growing species. The FRCC held public consultations on this stock in Placentia, Marystown and Harbour Breton, during November 2001. Due to pressure of other business there was relatively little comment on this stock at the consultations. The Council received a written brief requesting that the TAC be increased to 1,000t.

ANALYSIS

There was no new scientific information available in 2001.

The 1999 Stock Status Report and the 2000 DFO Newfoundland Region Groundfish Overview indicate that:

- Stock size estimates during the last several years have fluctuated within a range which, on average, is about two-thirds of the average stock size during the late 1980s and early 1990s.
- No indication of increased recruitment.
- Stock appears to be stable under current level of exploitation.

Quotas for witch were first set in the mid-1970s at 3,000t; these were reduced to 1,000t in the late 1980's. Catches come mainly from St. Pierre Bank in depths of 200-900 m. The research survey relative biomass index has shown substantial variation but no trend between 1976-1994. The research survey does not cover Fortune Bay where a large portion of the catch occurs. The 1999/2000 GEAC surveys show results similar to the DFO survey. The CPUE in the offshore fishery has increased from 843 kg/hr in 1999 to 1092 kg/hr in 2001 and inshore fishermen indicate that catches in the seining fishery have been among the highest seen.

The FRCC is pleased to note that following its 2000 recommendation, mesh size has now been standardized at 155mm diamond.

The FRCC recommends that the TAC for 3Ps witch flounder be set at 650t for 2002/2003.

The FRCC continues to recommend that given there has been no new assessment of this stock, a joint DFO/industry study be conducted in the inshore areas to assist in the overall assessment process such as appropriate biological sampling, a tagging/ movement component, and identification of stock sub-components. The industry survey is to be conducted concurrently with the DFO research vessel survey to ensure that no double counting or "missed fish" occurs due to possible movement into/ out of survey areas.

The FRCC continues to recommend that tonnages required for this work are to be determined by DFO science and allocated for this purpose only upon approval of a comprehensive plan. These catches are to be in addition to TAC.

An evaluation of the study is to be conducted upon completion of its year of implementation.

Figures are in 000t

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001*
TAC	3	3	3	1	1	1	1	1	1	1	1	0.5	0.5	0.65	0.65	0.65	0.65
Catch	0.6	1.1	1	0.30	0.87	1	1.1	1	0.86	0.4	0.26	0.23	0.28	0.51	0.71	0.21	0.18

*Catch as of Dec. 12/01

1. Figures are from the Integrated Fisheries Management Plan Atlantic Groundfish

Sources

DFO Science

SSR A2-09 (1999) Witch flounder in NAFO Subdivision 3Ps

SSR A2-19 (2000) Newfoundland Region Groundfish Overview

FRCC Consultations

Placentia, NF (November 19)
Marystown, NF (November 20)
Harbour Breton, NF (November 21)

Written Briefs

4R3Pn Based Danish Seine Fleet (2001-010-00244)

Council's Views on Stock Status

Overall Stock Indicator:	about recent average
	Compared to average
Spawning Biomass:	not available
Overall Biomass:	two-thirds of late 1980s and early 1990s
Recruitment:	about long term average
Growth and Condition:	not available
Age Structure:	not available
Distribution:	in deep water
Recent Exploitation Level:	low

Appendix 1: Science Priorities Letter

LETTER TO THE MINISTER

November 15, 2001

The Honourable Herb Dhaliwal, P.C., M.P.
Minister of Fisheries and Oceans
200 Kent Street
Ottawa, ON
K1A 0E6

Dear Minister:

An important part of the mandate of the Fisheries Resource Conservation Council (FRCC) is to provide you with advice on priorities for DFO science. As you appreciate, good information from both science and from the fishing industry are vitally important to our ability to provide you with sound and credible advice on many important groundfish stocks in Atlantic Canada. The need for science in fisheries is clear and the FRCC continues to be a full supporter of fisheries science both within DFO and the academic community in Canada.

In the past, the FRCC has made recommendations for specific projects. These remain important, and we note that many of these have already been acted upon. Some have not, such as the need to identify critical habitats (e.g. key spawning and juvenile areas of many species), and we reiterate the need to accomplish this and other unattained objectives. Nevertheless, in this letter we would like to stress three more generic issues that the FRCC and the fishing industry believe to be essential as priorities for Science in the immediate term:

- a revitalisation of the scientific basis of fisheries management;
- improved monitoring and surveying of fish stocks and the environment; and
- improvements in the communication of DFO science.

REVITALISATION OF SCIENTIFIC BASIS

Through a focus on this issue, the Council seeks to ensure that DFO Science has the human resources required to continue to provide the information necessary for the conservation and sustainable use of Canadian fishery resources.

The Assistant Deputy Minister of Science recently indicated to the Council that the DFO scientific workforce has an average age of 55 years and many will retire in the near future. The same is true of fisheries scientists in academia. Canada is not training sufficient fisheries scientists, especially those with quantitative skills addressing population dynamics, surveys and stock assessment. Consequently, the former leadership position that Canada held in these areas is being eroded. There is a vital need now to reinvigorate fisheries science training in Canada. The FRCC notes that the United States is in the same position and recent Canadian graduates are finding better opportunities there. It is therefore vital that DFO immediately initiate a two pronged strategy to bolster academic training in Canada and provide career opportunities for new fisheries scientists. Firstly, a program involving universities, DFO and industry through scholarships, and co-operative training and education would help foster better training at the graduate level. Second, increased employment opportunities within the federal government upon graduation are also needed to avoid the impending crisis that Canada faces within its ageing fisheries science community.

Through such a two pronged strategy, new scientists would benefit from the experience of seasoned scientists, and melding the two is likely to be the most effective way to maintain vitality within the fisheries science group. The window of opportunity to do this is short, because it will require several years to recruit and train new scientists. This must be done before many of the more experienced fisheries scientists in Canada retire. Our focus should be to attract new scientists who are familiar with fisheries and who are willing and able to interact with the fishing industry and the wider community. Training of such scientists cannot take place overnight and requires the active involvement of academics and academic institutions, the DFO Science Sector, and industry.

I also note that the recent report from our western counterpart, the Pacific Fisheries Resource Conservation Council provides some interesting thoughts on the issue of fisheries education. While somewhat focussed on the PFRCC mandate for Pacific salmon, I think the issues raised apply within the scope of our mandate as well.

Improved Monitoring

The Council's objective in focussing on this issue is to provide the efficient, continuous monitoring and surveying of fish stocks, fisheries and the biotic and abiotic environments which are required by scientific advice. The entire fishing industry, and indeed all stakeholders with an interest in Canada's oceans, depend on the processes of accumulating and interpreting biological and other scientific information about fisheries and stocks through regular oceans monitoring and stock survey programs.

The Council is concerned about the seemingly constant erosion in the amount of stock monitoring and surveying programs which has become the norm in DFO. This erosion is due in part to the regional structure of the Department, in part to lack of financial resources, and in part to the human resource issues to which we referred earlier.

It is not clear to the Council that the fleet amalgamation that your Department has undergone has been in the best interests of your mandate for conservation and sustainable use. Fleet managers are faced with conflicting objectives such as the need to undertake search and rescue operations and scientific research, sometimes simultaneously. Crewing regimes, such as lay day crewing and seasonal lay-offs of fishing crews, and the lack of fishing experience among crews may lead to inconsistencies in survey results compared with past years.

The Council further understands that operating costs for scientific cruises are increasing rapidly, without a commensurate increase in their informational output: this threatens the integrity of research vessels surveys.

The Council also emphasises the need to make monitoring more cost-effective and efficient by making use of innovative and newer designs, techniques and technologies, including the use of vessels and survey design protocols additional to those of the traditional DFO stratified random trawl surveys. The Council supports an expansion of sentinel surveys as indexes of abundance, the use of joint industry-DFO surveys, and increasing use of acoustic survey techniques, as examples of such innovations.

Communication

This issue is perhaps the most difficult one which DFO Science faces. The ability to communicate not only new scientific findings, but also to explain the methodology involved is paramount given the potential impact of these methods and findings on Canada's coastal communities.

From our last advice to you on priorities for DFO Science, the Council reiterates its call for the need to develop an integrated and co-ordinated vision of the application of science across all regions. In that advice, we underlined that research groups have a tendency to work in isolation, and do not take advantage of the expertise in different regions and disciplines, inside and outside DFO.

The FRCC would like to see better and improved communications in the following areas:

- more ongoing dialogue on stock status between scientists and the fishing industry;
- on incorporating fishermen's observations into scientific assessments;
- on new developments in stock assessment methodologies; and,
- greater information sharing and co-ordination among regions.

DFO Science needs to improve its communication both internally and externally with industry and the public. Our work makes us very aware of the stubborn regionalism of DFO Science and there is a clear need for more policy co-ordination and information exchange among regions. Even more importantly, communication and interaction with industry, fishermen and even with the FRCC is far from adequate. At worst, there is open distrust and hostility, which we face, as your Council, at almost every consultation. There are concrete actions that can be taken to alleviate this situation.

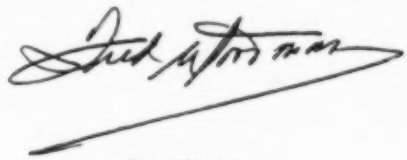
The Council provides the following as examples of what we view as positive developments in communications:

- the communication process for the northern Gulf of St. Lawrence sentinel fishery, which includes regular meetings to discuss results, information dissemination through a website and newsletters, and the dedication of the DFO staff to providing this information to fishermen

- the inclusiveness of the Southern Gulf and Newfoundland RAP sessions whereby industry participates in all phases of the RAP
- the work of individual scientists to include industry and sentinel surveys in stock assessments.

Efforts such as these, and other increased communication efforts between DFO science and the fishing industry and communities should be encouraged and recognized.

Minister, good scientists, good information and good communications are integral tools required for you to fulfill your mandate. The Council hopes that by stressing these areas we are assisting you in ensuring that your mandate can continue to be fulfilled.



Fred Woodman
Chairman

Appendix 2: FRCC Mandate and Membership

FRCC Terms of Reference

1. Introduction

The Government of Canada is committed to a more comprehensive approach to the conservation and management of our fisheries resource. This approach demands a better understanding of complex fisheries ecosystems - the interaction of fish with other species, predator-prey relationships, and also changes in the marine environment like ocean currents, water temperatures and salinity.

The Government of Canada is also committed to a more effective role in decision-making for those with practical experience and knowledge in the fishery.

The Minister of Fisheries and Oceans has established the Fisheries Resource Conservation Council (FRCC) as a partnership between government, the scientific community and the direct stakeholders in the fishery. Its mission is to contribute to the management of the Atlantic fisheries on a 'sustainable' basis by ensuring that stock assessments are conducted in a multi-disciplined and integrated fashion and that appropriate methodologies and approaches are employed; by reviewing these assessments together with other relevant information and recommending to the Minister total allowable catches (TACs) and other conservation measures, including some idea of the level of risk and uncertainty associated with these recommendations; and by advising on the appropriate priorities for science.

2. Definition of Conservation

Fisheries conservation is that aspect of the management of the fisheries resource which ensures that its use is sustainable and which safeguards its ecological processes and genetic diversity for the maintenance of the resource. Fisheries conservation ensures that the fullest sustainable advantage is derived from the resource and that the resource base is maintained.

3. Council Objectives

3.1 To help the government achieve its conservation, economic and social objectives for the fishery.The conservation objectives include, but are not restricted to:

3.1.1 rebuilding stocks to their 'optimum' levels and thereafter maintaining them at or near these levels, subject to natural fluctuations, and with 'sufficient' spawning biomass to allow a continuing strong production of young fish; and,

3.1.2 managing the pattern of fishing over the sizes and ages present in fish stocks and catching fish of optimal size.

3.2 To develop a more profound understanding of fish-producing ecosystems including the inter-relationships between species and the effects of changes in the marine environment on stocks.

3.3 To review scientific research, resource assessments and conservation proposals, including, where appropriate, through a process of public hearings.

3.4 To ensure that the operational and economic realities of the fishery, in addition to scientific stock assessments, are taken into account in recommending measures to achieve the conservation objectives.

3.5 To better integrate scientific expertise with the knowledge and experience of all sectors of the industry and thus develop a strong working partnership.

3.6 To provide a mechanism for public and industry advice and review of stock assessment information.

3.7 To make public recommendations to the Minister.

4. Mandate and Scope

4.1 The Fisheries Resource Conservation Council will address these objectives by bringing together industry, DFO science and fisheries management, and external scientific and economic expertise in one body.

4.2 The Council will:

4.2.1 advise the Minister on research and assessment priorities;

4.2.2 review DFO data and advise on methodologies;

4.2.3 consider conservation measures that may be required to protect fish stocks;

4.2.4 review stock assessment information and conservation proposals, including through public hearings, where appropriate; and,

4.2.5 make written public recommendations to the Minister on TACs and other conservation measures.

4.3 The Council may recommend any measures considered necessary and appropriate for conservation purposes such as TACs, closure of areas to fishing during specific periods, approaches to avoid catching sub-optimal sized fish or unwanted species, and restrictions on the characteristics or use of fishing gears.

4.4 The Council's scope includes Canadian fish stocks of the Atlantic and Eastern Arctic Oceans. In the first instance, the Council will address groundfish, and then subsequently take on responsibility for pelagic and shellfish species.

4.5 The Council may also advise the Minister on Canada's position with respect to straddling and transboundary stocks under the jurisdiction of international bodies such as the Northwest Atlantic Fisheries Organization (NAFO).

5. Size, Structure and Make-Up

5.1 The Council will consist of not more than 14 members with an appropriate balance between 'science' and 'industry'.

5.2 Members are chosen on merit and standing in the community, and not as representatives of organizations, areas or interests.

5.3 'Science' members, are drawn from government departments, universities or international posts, and are of an appropriate mix of disciplines, including fisheries management and economics.

5.4 'Industry' members are knowledgeable of fishing and the fishing industry and understand the operational and economic impacts of conservation decisions.

5.5 All members of the Council are appointed by the Minister.

5.6 All members, including the Chairperson, are appointed for a three year term; terms can be renewed.

5.7 Members appointed from DFO serve 'ex officio'.

5.8 Members have to disclose any interest in the Atlantic or Eastern Arctic fishery and take appropriate measures so as to avoid potential or real conflict of interest situations during the term of appointment.

5.9 The four Atlantic Provinces, Quebec and Nunavut may each nominate one delegate to the Council. These delegates have access to the Council's information, and may participate fully in meetings, but will not be asked to officially endorse the formal recommendations to the Minister.

5.10 The Council is supported by a small Secretariat, to be located in Ottawa. The Secretariat will:

5.10.1 provide administrative support for the functioning of the Council;

5.10.2 provide a technical science and fisheries management support;

5.10.3 organize Council meetings;

5.10.4 record decisions of the Council;

5.10.5 undertake a professional communications function for the Council, providing a central point for communications to and from the Council; and

5.10.6 undertake such other matters as from time to time might be appropriate.

5.11 The Chairman may appoint an Executive Committee, consisting of the Chairman, Vice-Chairman, and three other Members.

5.12 In addition, the Chairman may, from time to time, strike an 'ad hoc' committee to deal with a specific issue.

6. ACTIVITIES:

6.1 Reviews appropriate DFO science research programs and recommends priorities, objectives and resource requirements.

6.2 Considers scientific information - including biology, and physical and chemical oceanography, taking into account fisheries management, fishing practices, economics and enforcement information.

6.3 Conducts public hearings wherein scientific information is presented and/or proposed conservation measures/options are reviewed and discussed.

6.4 Recommends TACs and other conservation measures.

6.5 Prepares a comprehensive, long-term plan and a work plan for the Council which are reviewed annually at a workshop with international scientists and appropriate industry representatives.

6.6 Ensures an open and effective exchange of information with the fishing industry and contributes to a better public understanding of the conservation and management of Canada's fisheries resource.

FRCC MEMBERSHIP:

MEMBERS:

Fred Woodman, Chairman
Jean-Claude Brêthes, Vice-Chair
Maurice Beaudin
Bill Broderick
Bruce Chapman
Charlie Dennis
Jean Guy d'Entremont
Gabe Gregory
Nick Henneberry
Frank Hennessey
Dan Lane
Paul Nadeau
John Pope
George Rose

PROVINCIAL DELEGATES:

Carey Bonnell, Nunavut
Mario Gaudet, New Brunswick
David MacEwan, Prince Edward Island
Dario Lemelin, Québec
Tom Dooley, Newfoundland and Labrador
Clary Reardon, Nova Scotia

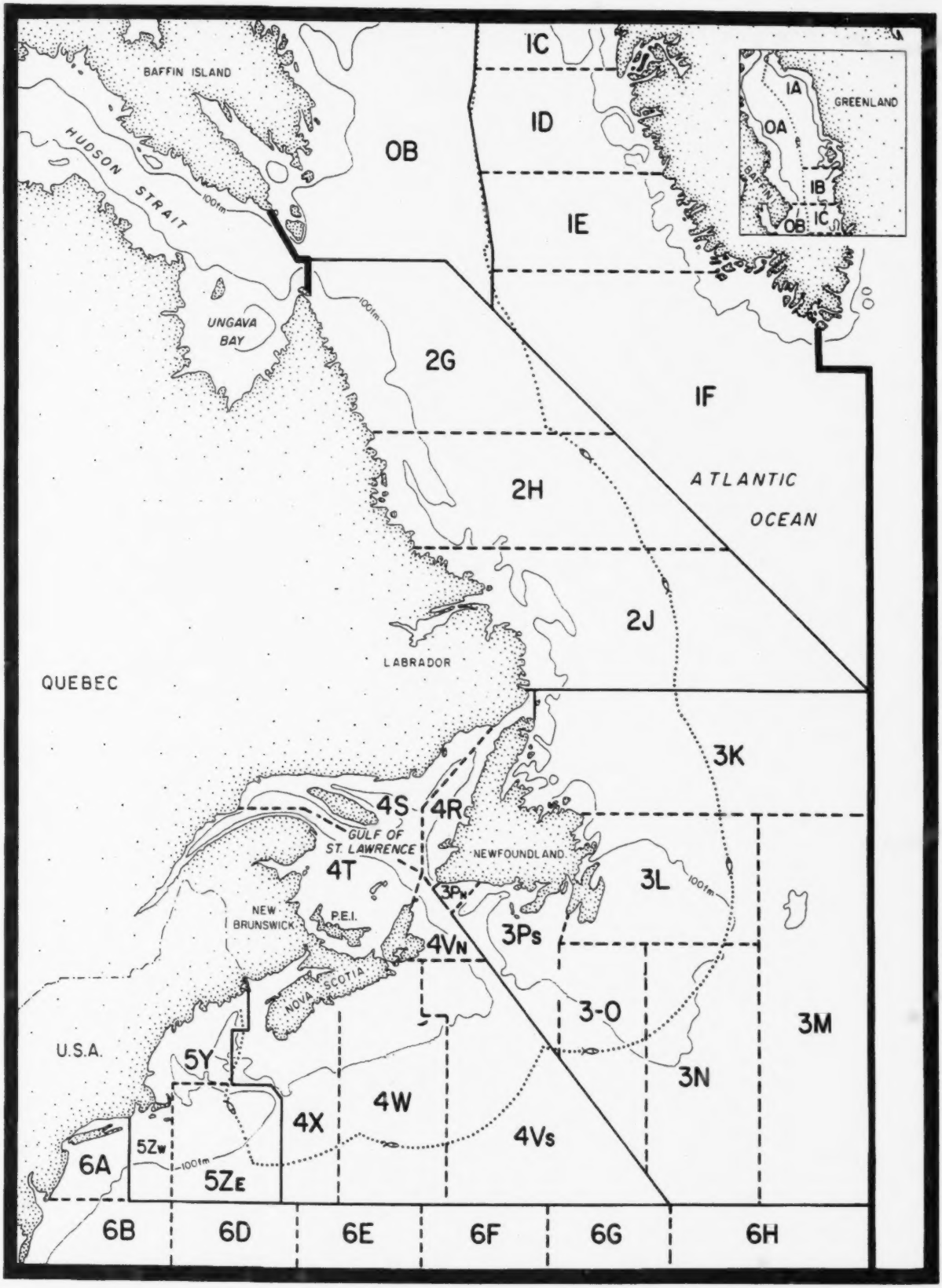
EX OFFICIO:

Gilles Belzille
Barry Rashotte
David Gillis

SECRETARIAT:

Michel G. Vermette, Executive Director
Tracey Sheehan
Helena DaCosta
Debra Côté

200 Mile Fishing Zone and NAFO Fishing Boundaries



Canada